

**MWINGI CENTRAL SUB-COUNTY JOINT MOCK EXAMINATION***Kenya Certificate of Secondary Education***443/1****AGRICULTURE****PAPER 1****JULY/AUGUST 2015****SECTION A (30 MARKS)***Answer ALL the questions in this section in the spaces provided.*

1. Define organic farming (1 mark)
2. List THREE soil constituents (1 ½ mark)
3. Give FOUR benefits of crop rotation (1mark)
4. State TWO disadvantages of using hydram pumps in pumping water in the farm (1mark)
5. List FOUR benefits of land consolidation in farming (2marks)
6. Name a crop weed that is:
  - (i) Parasitic to maize crop (½ mark)
  - (ii) Alternate host for rusts (½ mark)
  - (iii) Aquatic (½ mark)
  - (iv) Has medicinal value (½ mark)
7. State THREE ways in which nitrogen is lost from the soil (1½ marks)
8. State FOUR benefits of mulching in soil and water conservation (2marks)
9. Give FOUR disadvantages of using organic manures in crop production (2marks)
10. (i) Define opportunity cost (1mark)
- (ii) Name Two types of inventory records kept by farmers (1mark)
11. (a) Give TWO importance of sub-soiling (1mark)
12. Give THREE ways in which nutrients can be lost from silage in a silo (1½ mark)
13. (i) Give TWO destructive effects of moles in crop production (1mark)
- (ii) Apart from moles, name TWO other rodent pests (1mark)
14. Give THREE characteristics of fixed inputs (1½ marks)
15. List FOUR financial documents kept by farmers (2marks)
16. State FOUR field pests that attack maize (2marks)
17. Differentiate between apiculture and aquaculture as used in Agriculture (1mark)
18. State TWO ways in which burning leads to loss of soil fertility (1mark)
19. State TWO benefits of hardening off seedlings before transplanting (1mark)

**SECTION B (20 MARKS)***Answer ALL the questions in this section in the spaces provided.*

20. The photograph below shows a farming practice. Study it and answer the questions that follow.



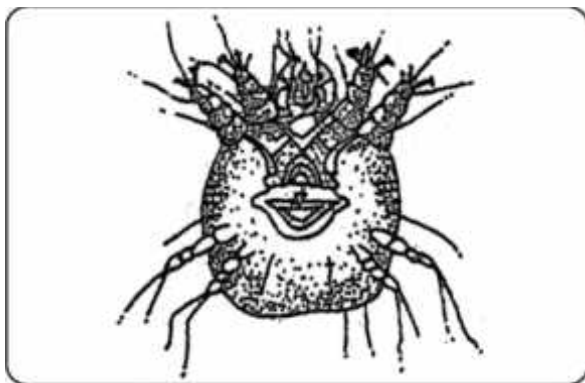
- (i) Name the practice (1mark)
- (ii) Name one crop to which the practice is applicable (1mark)
- (iii) Give TWO benefits of the practice above (2marks)

21. Study the farm record below and use it to answer the questions that follow.

| Date      | Amount Sold | Price per unit (Kshs.) | Total value (Kshs) | Where sold           | Remarks        |
|-----------|-------------|------------------------|--------------------|----------------------|----------------|
| 19/5/2015 | 120kg       | 30                     | 3,600              | Professional Agrovet | Fair Price     |
| 20/5/2015 | 150kg       | 32                     | -                  | Nunguni Agrovet      | To supply more |

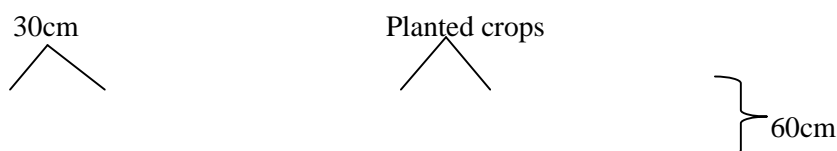
- (i) Name the type of farm record above (1mark)  
(ii) On the record fill the missing values (1mark)  
(iii) Give a farm statement that heavily depends on information extracted from the farm record named above (1mark)

22. The diagram below illustrates a crop pest



- (i) Identify the pest (1mark)  
(ii) Give TWO reasons why the above pest is difficult to control (2marks)  
(iii) Give a reason why indiscriminate use of pesticide on the farm may cause increased crop damage by the above pest (1mark)

23. The diagram below shows a method of planting used to establish a certain variety of crop



- (i) Identify the method of planting used (1mark)  
(ii) Give the interplant spacing followed above (1mark)  
(iii) Give THREE advantages of the above method of planting (3marks)  
(iv) The spacing above was used to establish a crop on an area of land measuring 6m by 3m. Calculate the crop population. Show your working (4marks)

### **SECTION C (40 MARKS)**

*Answer ANY TWO questions from this section in the spaces provided.*

24. (a) Explain challenges faced by Kenyan vegetable farmers in the production of crops (10mks)  
(b) Discuss various safety precautions observed when using herbicides (5mks)  
(c) Describe the benefits of minimum tillage in crop production (5mks)
25. (a) Outline various ways in which land fragmentation increases the cost of food production in Kenya (5mks)  
(b) Describe the importances of top dressing in pasture establishment (5mks)  
(c) Explain FIVE factors that influence soil erosion (10mks)
26. (a) Describe the importance of any FIVE nursery management practices in crop production (10mks)  
(b) State the functions of farm manager in agricultural production (10mks)

**MWINGI CENTRAL SUB-COUNTY JOINT MOCK EXAMINATIONS***Kenya Certificate of Secondary Education***443/2****AGRICULTURE PAPER 2****JULY/AUGUST 2015****SECTION A (30 MARKS)***Answer ALL the questions in this section in the spaces provided.*

1. State FOUR categories of produce stores found in a farm (2mks)
2. Give TWO reasons for tooth clipping in piglets (1mk)
3. State TWO uses of a rake (1mk)
4. State TWO diseases that may affect bees in a colony (1mk)
5. Differentiate between a heifer and a cow (1mk)
6. Name FOUR species of livestock that are affected by tapeworms (2mks)
7. Name FOUR viral diseases that affect poultry (2mks)
8. State FOUR disadvantages of natural incubation in poultry production (2mks)
9. Name TWO causes of bad flavours in milk production (1mk)
10. Give TWO causes of death in cows during or after parturition (1mk)
11. Differentiate between roughages and concentrates as used in livestock nutrition (1mk)
12. List THREE zoonotic diseases that can occur on the farm (1½ mks)
13. State FOUR uses of harrows on the farm (2mks)
14. State FOUR signs of heat in pigs (2mks)
15. Name FOUR plant species that can be used to establish live fences (2mks)
16. Give TWO benefits of scattering grains in a deep litter poultry house (1mk)
17. List THREE types of lubrication systems in farm machines (1½ mks)
18. List THREE sheep breeds reared for meat production in Kenya (1½ mks)
19. List THREE farm tools used during castration of farm animals (1½ mks)
20. Give FOUR disorders associated with calcium deficiency in livestock (2mks)

**SECTION B (20 MARKS)***Answer ALL the questions in this section in the spaces provided after every question.*

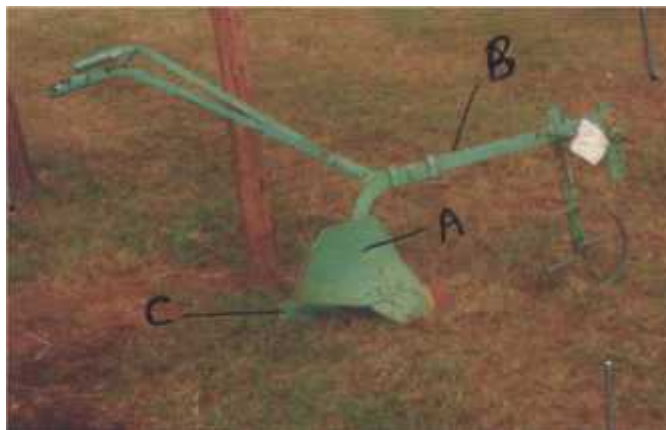
21. The photograph below illustrates a livestock rearing practice carried out in the farm.



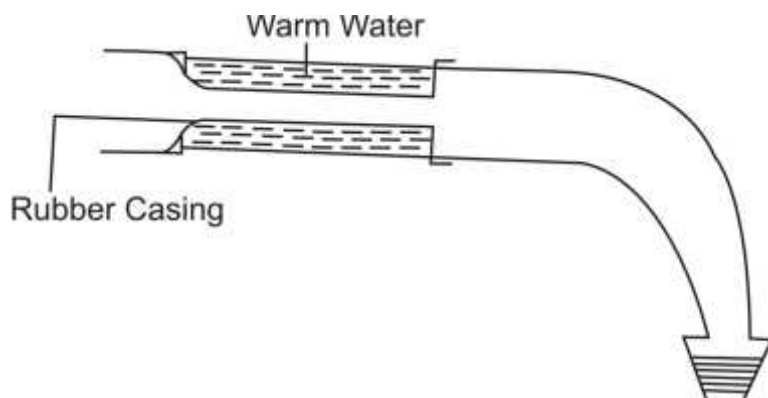
- (i) Identify the practice (1mk)
  - (ii) Give two farm tools used to carry out the above practice (2mks)
  - (iii) Give TWO importances of carrying out the above process (2mks)
22. Fill in the table below (3mks)

| Animal | Gestation Period |
|--------|------------------|
| Cattle |                  |
| Pig    |                  |
| Rabbit |                  |

23. The photograph below shows a farm implement



- (i) Identify the implement (1mk)
  - (ii) Label parts A and B (2mks)
  - (iii) State the function of part labeled C (1mk)
  - (iv) Explain TWO maintenance practices done on the implement (2mks)
24. The diagram below shows an equipment used in livestock breeding.



- (i) Identify the equipment (1mk)
- (ii) What is the importance of:
  - (a) Using warm water on the equipment (1mk)
  - (b) Smearing Vaseline jelly on the rubber casing before use (1mk)
- (iii) Outline the procedure of using the above equipment in the farm (3mks)

### **SECTION C (40 MARKS)**

*Answer ANY TWO questions in this section in the spaces provided after question 27*

25. (a) Discuss symptoms of tapeworm attack in farm animals (5mks)
- (b) Discuss pneumonia disease in livestock under the following sub-headings
  - (i) Animals attached (3mks)
  - (ii) Predisposing factors (3mks)
  - (iii) Symptoms of attack (4mks)
- (c) Describe qualities of a goat house that help to control diseases (5mks)
26. (a) Outline the importance of water in livestock nutrition (6mks)
- (b) Give FOUR functions of the gear box in a tractor (4mks)
- (c) Discuss ways of improving milk production (5mks)
27. (a) Give FIVE qualities of camels that enable them to survive the harsh conditions of arid and semi-arid areas (5mks)
- (b) Outline various challenges hampering successful poultry production in Kenya (7mks)
- (c) Discuss uses of various farm hand tools in the construction of a cattle dip (8mks)

**MWINGI CENTRAL SUB-COUNTY JOINT MOCK EXAMINATION**  
**AGRICULTURE PAPER 1**  
**443/1**  
**MARKING SCHEME**  
**SECTION A (30 MARKS)**

- 
1. It is the growing of crops and rearing of livestock without using agricultural chemicals 1mk
2. Soil constituents
- (a) Soil air
  - (b) Soil water
  - (c) Mineral matter
  - (d) Organic matter
  - (e) Living organisms 3 x ½ (1 ½ mk) max 1½ mk
3. Benefits of crop rotation
- Improves soil fertility
  - Control weeds
  - Improve soil structure
  - Control soil erosion
  - Maximum utilization of nutrients
  - Control build-up of soil borne pests and diseases (4 x ½) = 2mks
4. Disadvantages of Hydrant pumps
- Pumps only stationery water
  - Pumps little quantities of water (2 x ½) = 1mk
5. Benefits of land consolidation
- Economic use of time
  - Saves transportation cost
  - Proper supervision of land
  - Sound farm planning and adoption of crop rotation programmes
  - Makes delivery of agricultural advice by extension officers easy
  - Easy to construct permanent structures like fencing and building
  - Easy to control pests, weeds and diseases
  - Easy to conserve soil and water (Any 4 x ½) 2mks
6. (i) Parasitic weed to maize
- Striga / witch weed 1 x ½ = ½ mk
- (ii) Alternate weed to rusts
- Wild oats / avena fatua 1 x ½ = ½ mk
- (iii) Aquatic-
- Salvinia (salvinia Guriculata) Any 1 x ½ = ½ mk
  - Water hyacinth (Eichhornia crassipes)
- (iv) With medicinal value
- Sodom apple (Solanum Incanum) Any 1 x ½ = ½ mks
  - Double thorn (oxygonum stinuatum)
7. How nitrogen is lost from the soil
- Volatilisation
  - Leaching
  - Combustion
  - Denitrification (Any 3 x ½ mk) 1 ½ mk
8. Benefits of mulching in soil and water conservation
- Reduces speed of run-off
  - Reduces rate of evaporation
  - Prevents splash erosion
  - Increase water retention
  - Increases water infiltration
  - Increases organic matter thus improving drainage (Any 4 x ½ mk) = 2mks
9. Disadvantages of organic manures
- Spread of diseases, pests and weeds
  - Bulky to transport and apply
  - Labourious in application and transportation

- Loses nutrients if poorly stored
  - Do not benefit crops if used when not fully decomposed (Any 4 x ½ mk) 2mks
10. (i) Opportunity cost is the returns from the best alternative forgone (W.T.E) 1mk  
(ii) Types of inventory records
- Permanent goods inventory
  - Consumable goods inventory (2 x ½ mk) = 1mk
11. Importance of sub-soiling
- Encourages gaseous exchange in soil (aeration)
  - Breaks hard pans
  - Brings leached minerals to the surface
  - Improves soil drainage (Any 2 x ½ mk) = 1mk
12. Sillage losses
- Surface spoilage
  - Seepage losses
  - Gaseous losses (3 x ½ mk) 1 ½ mk
13. (i) Destructive effects of moles
- Destroys crop roots thus interfering with absorption of water and nutrients
  - Pulls plants underground causing their death
  - Spoils pastures by covering them with soil from burrowed tunnels (Any 2 x ½ )1mk
- (ii) Other rodent pests
- Squirrels
  - Rats
  - Mice
  - Porcupine
  - Hedgehogs (Any 2 x 1 ½) = 1mk
14. Fixed inputs (characteristics)
- Constancy
  - Not varying with level of production
  - Their costs are not allocated to specific enterprises (3 x ½ mk) = 1 ½ mk
15. Financial Documents
- Invoice
  - Receipt
  - Delivery note
  - Statements
  - Purchase order (Any 4 x ½) = 4mks
16. Field pest that attack maize
- Maize stalk borer (ReJ: stalk borer)
  - Army worm
  - Aphid
  - Birds
  - Rats (Any 4 x ½) = 2mks
17. Agriculture is the rearing of bees in beehives  
Aquaculture is the rearing of fish in fish ponds (Mark as a whole) 1mk
18. Ways through which burnings leads loss of soil fertility
- Destroys organic matter
  - Ash accumulation leads to nutrient imbalance
  - It kills/ destroys soil micro-organisms
  - Exposes soil to agents of soil erosion
  - Destroys soil structure increasing soil erodability
  - Exposure of soil nutrients to high temperature causes increased volatilization of nutrients(Any 2 x ½) 1mk
19. Benefits of hardening off
- Reduces chances of drying-up of seedlings after transplanting
  - Enables seedlings to establish themselves faster in the main field

**SECTION B (20 MARKS)**

20. (i) Trellising (1mk)  
(ii) Passion fruit  
Tomatoes (Any 1 x 1) 1mk  
(iii) Benefits of trellising (Any 1 x 1) 1mk  
– Ensures production of clean fruits  
– Enables easy harvesting  
– Enable easy spraying of chemical  
– Control of fungal diseases  
– Controls growth pattern of the crop (Any 2 x 1) = 2mks
21. (i) Marketing record (1mk)  
(ii) Kshs. 4,800/- (1mk)  
(iii) Profit and loss account (1mk)
22. (i) Mith  
(ii) It is too small in size (microscopic) to be noticed easily/early  
It breeds fast leading to higher pest population within a short period of time (2 x 1) = 2mks  
(iii) The pesticide kills its natural enemies which naturally help in biological control of the pest e.g. termites (1mk)
23. (i) Row planting (1mk)  
(ii) 30Lm (1mk) Rej: 30cm by 60cm  
(iii) Advantages of row planting  
– Easy to establish crop population  
– Easy to use machines between the rows  
– Low seed rate is used  
– Easy to estimate crop yield  
– Easy to carry out cultural practices e.g. weeding, spraying, harvesting etc (Any 3 x 1 = 3mks)  
(iv) Plant population =  $\frac{\text{Area of land}}{\text{Spacing}}$  1mk  
Area of Land = 600cm x 300cm 1mk  
Spacing = 30cm x 60cm  
PP =  $\frac{600\text{cm} \times 300}{30\text{cm} \times 60\text{cm}}$  1mk  
 $\frac{180,000\text{cm}}{1800\text{cm}}$  100 plants 1mk  
Total = 4mks

**SECTION C (40 MKS)**

24. (a) Challenges facing vegetable farmers  
– High cost of farm inputs  
– Lack of storage facilities leading to spoilage of produce  
– Poor transport network leading to deterioration of produce before reaching market  
– Lack of technical knowhow on the best farming practices to adopt when growing the crops  
– Inadequate market for their produce  
– Exploitation by middlemen  
– Unfavourable environmental factors e.g. poor rainfall patterns: poor soils  
– Pests and diseases  
– Inadequate extension (10 x 1) = 10mks
- (b) Safety precautions observed when using herbicides  
– Read and follow manufacturers instructions  
– Wear protective clothing  
– Avoid inhaling the herbicides by not spraying against wind, not smoking and wearing a breathing mask  
– Don't blow or suck blocked nozzles with the mouth  
– Bath thoroughly after handling the chemicals  
– Keep chemicals out of reach of children (safe storage)  
– Proper disposal of empty containers  
– Don't wash spraying equipment in water sources (Any 5 x 1mk = 5mks)
- (c) Benefits of minimum tillage

- Reduces cost of cultivation
  - Control of soil erosion
  - Maintain soil structure
  - Conserve soil moisture
  - Prevent disturbance of crop roots
  - Prevent exposure of humus to sun's heat (Any 5 x 1mk = 5mks)
25. (a) How land fragmentation increases production cost
- Increased transport cost moving from one plot to another
  - High Managerial cost for the different plots
  - Increased cost of extension advice visits
  - High cost of pest, weed and disease control
  - High costs of replacing temporal fences and other structures on the different plots
  - Poor farm mechanization causing manual operations which are expensive
  - Any other relevant point (Any 5 x 1mk = 5mks)
- (b) Importance of top-dressing in pasture establishment
- Replenish soil nutrients and ensure proper nutrient balance
  - To increase herbage yield
  - To improve the nutritive value of the crop
  - To correct/amend physical and chemical properties of soil e.g. soil structure, water holding capacity and soil PH
  - To enable the soil micro-organism to break down organic resolves into available nutrients(5 x 1mk) = 5mks
- (c) Factors influencing soil erosion
- Type of soil – sandy soils are easily eroded than clay soils
  - Amount and density of rainfall – Heavy rainfall causes more erosion
  - Slope of land/topography – steep slopes increase erosion rate
  - Soil depth – shallow soils are easily eroded
  - Vegetation cover – Bare lands are easily erodes
  - Human activities – activities like deforestation, overgrazing, burning of vegetation cover and clean weeding encourage soil erosion  
*Any five well explained x 2 marks = 10mks*
26. Importance of Nursery Management practices in crop production
- Mulching – Helps to conserve moisture but should be removed immediately seedlings begin to emerge
  - Weed control – To avoid competition for water and nutrients
  - Shading- Prevents loss of soil moisture and prevent direct sun heat to the seedlings
  - Pricking out – To prevent overcrowding of seedlings and excessive competition
  - Watering – To supply adequate moisture to the seedlings to avoid drying of the seedlings
  - Pest and disease control - To control death of seedling
  - To prevent quality reduction
  - Hardening off – To prepare seedling to adapt to conditions in the main field  
*(Any five well explained x 2 mks = 10mks)*
- (b) Functions of a Farm Manager
- Long term planning
  - Short term planning
  - Implementing farm plans
  - Taking responsibility of outcome of farm activities
  - Comparing standards of one enterprise and the set standards
  - Keeping farm records upto date
  - Detecting weaknesses and constrains and finding ways of overcoming them
  - Acts as the farm spokesman
  - Gathering information
  - Comparing performance of the farm with the neighbouring farms
  - He / she is the overall farm supervisor  
*(Any 10 valid points x 1mk = 10mks)*



**MWINGI CENTRAL SUB-COUNTY JOINT MOCK EXAMINATION****443/2****AGRICULTURE PAPER 2****MARKING SCHEME**

- 
1. Categories of produce store
    - Traditional granaries
    - Modern stores
    - Silos
    - Cyprus bins

(4 x ½) = 2mks
  2. Reasons for tooth clipping
    - To prevent injury incase piglets fight
    - To avoid injury to mothers teats during suckling
    - To facilitate proper feeding of the piglets

(Any 2 x ½) = 1mk
  3. Uses of a rake
    - Levelling the ground during land preparation
    - Removing weed/trash from cultivated area

2 x ½ = 1 mk
  4. Diseases of bees
    - Acarive
    - American foul brood

2 x ½ = 1 mk
  5. Heifer – A young female cattle between weaning and first calving  
Cow – A mature female cattle (Mark as a whole) 1mk
  6. Species of livestock affected by tapeworms
    - Pigs
    - Goats
    - Cattle
    - Sheep
    - Donkeys

(Any 4 x ½) = 2mks
  7. Viral diseases that affect poultry
    - New castle
    - Marek's disease (fowl paralysis)
    - Gumboro
    - Avian flu
    - Fowl pox

Any 4 x ½ = 2mks
  8. Disadvantages of natural incubation
    - Few chicks hatched at one time
    - Farmer can't plan when to incubate
    - Diseases and parasites can be easily transmitted to the chicks from hen
    - Hens can only be used when broody
    - Death of the bird will collapse the process

(Any 4 x ½ ) 2mks
  9. Causes of bad flavours in milk production
    - Feedstuffs with strong smells prior to milking e.g. onions, pineapple fruit waste, Mexican marigold. Rej: feedstuffs alone
    - Oxidation from exposure to sun or containers with traces of iron or copper

2 x ½ = 2 mks
  10. Causes of death in cow during or after parturition
    - Malpresentation of calf (Acc breech presentation)
    - Excessive bleeding after birth
    - Milk fever in high yielding animals

Any 2 x ½ = 1 mk
  11. Roughages – It is a feedstuff with high fibre and carbohydrate content and low in protein  
Concentrate – It is a feedstuff with high amount of proteins or energy (carbodrates) but low in crude fibre  
Mark as a whole = 1mk
  12. Zoonotic diseases
    - Anthrax
    - Brucellosis (contagious abortion/bang's diseases)
    - Tuberculosis
    - Rabbies

(Any 3 x ½ = 1 ½ mks
  13. Uses of harrows
    - i) Levelling seedbed
    - ii) Breaking soil clods
    - iii) Stirring the soil
-

- iv) Destroying weeds  
v) Burying trash (Any 4 x ½ = 2 mks)
14. Signs of heat in pigs  
– Restlessness  
– Frequent urination  
– Swelling and reddening of vulva  
– Clear or slimy mucus discharge from vulva  
– Respond positively to rider's test  
– Frequent mounting others (Any 4 x ½ mk) = 3mks
15. Plant species used to establish live fence  
– Tick berry (lantana Gamara)  
– Kei apple  
– Crotons  
– Gacti  
– Sisal  
– Euphobia  
– Bougainvillea  
– Mauritius thorn  
– Cypress (Any 3 x ½ = 2 mks)
16. Benefits of scattering grains in deep litter house  
– Provides supplementary feed to the bird  
– Birds help to turn the litter as they scratch for the grain  
– Keeps bird busy when scratching thus preventing vices (Any 2 x ½) 1mk
17. Types of lubrication system  
– Splash feed  
– Force feed  
– Oil mist 3 x ½ = 1 ½ mk
18. Sheep breeds reared for meat  
– Dorper  
– Black head Persian  
– Red Maasai sheep 3 x ½ = 1 ½ mks
19. Tools used during castration  
– Burdizzo  
– Elastrator and rubber ring Rej: elastrator alone  
– Scapel 3 x ½ = 1 ½ mk
20. Disorders associated with calcium deficiency in animals  
– Milk fever  
– Soft shelled eggs  
– Egg without shells (shell-less eggs)  
– Osteomalacia/osteoporosis  
– Rickets (Any 4 x ½ (2mks))
- SECTION B (20 MARKS)**
21. (i) Hoof trimming 1mk  
(ii) Tools used for hoof trimming  
– Hoof trimming knife Rej: knife  
– Hoof cutter  
– Hoof rasp (Any 2 x 1 = 2mks)  
(iii) Importance of hoof trimming  
– Facilitates easy movement of the animal  
– Control foot rot diseases  
– Prevent rams from injuring ewes during tuppung (Any 2 x 1) 2mks

| Animal | Gestation period          |
|--------|---------------------------|
| Cattle | 270 - 282 days (9 months) |
| Pig    | 113 - 117 days            |
| Rabbit | 28 - 32 days              |

Accept any days within the range (3mks)

23. (i) Ox-plough / ox-drawn plough Rej: plough 1mk  
(ii) A - Mould board (1mk)

- B - (1mk)
- (iii) Presses against unploughed land thus stabilizing the plough (1mk)
- (iv) (a) Cleaning after use to remove dirt (1mk)
- (b) Sharpening the share to improve efficiency
- (c) Lubrication the land wheel bearing to reduce friction
- (d) Apply oil during long storage to avoid rusting
- Rej: oiling (Mark as a whole) Any 2 x 1 (2mks)
24. (i) Artificial vagina (1mk)
- (ii) (a) Warm water – To moak the temperatures of a natural vagina (1mk)
- (b) Smearing with vaseline – To lubricate to avoid friction which may cause injury to the bulls penis (1mk)
- (iii) Procedure for collecting semen
- Restrain a teaser cow in a crush
  - A bull is brought to the thaser cow
  - When the bull mounts on the cow grab its penis and direct it to the artificial vagina where it will ejaculate (stop marking if the procedure is broken) 3mks

### SECTION C: 40 MARKS

25. (a) Symptoms of tapeworm attack
- General emaciation
  - Staring/rough coat
  - Scouring / constipation
  - Pot bellies in calves
  - Oedematous swelling under the jaw
  - Parasite segment seen in faeces
  - Anaemic condition in heavy attack
  - Excessive appetite (Any 5 x 1 = 5mks)
- (b) Pneumonia Disease
- (i) Animals attacked
- Calves
  - Kids
  - Lambs
  - Piglets
  - Poultry (Any 3 x 1 = 3mks)
- (ii) Predisposing factors
- Poor ventilation in animal houses
  - Overcrowding
  - Effects of diarrhea and other illnesses
  - Agl – Young animals are more susceptible
  - Chilly weather (Any 3 x 1 = 3mks)
- (iii) Symptoms of attack
- Loss of appetite
  - Rough hair coat
  - Emaclation
  - Rapid breathing
  - Animal becomes dull and reluctant to move
  - Abnormal lung sounds such as hissing, gurgling and bubbling when breathing
  - Fluctuating body temperatures
  - Nasal mucus discharge
  - Animal coughs when chest is pressed (Any 4 x 1 = 4 mks)
- (c) Qualities of a goat house that help to control diseases
- Spacious
  - Well ventilated
  - Leak proof
  - Well drained
  - Easy to clean
  - Draught free Any 5 x 1 = 5 mks
26. (a) Importance of water in livestock nutrition
- Component of body cells and body fluids

- Transportation of nutrients in the body
  - Maintains cell turgidity
  - Used in biochemical reactions in the body e.g. food digestion
  - Helps to regulate body temperature through sweating and evaporation
  - Helps in excretion of waste products from the body
  - Forms part of animal product e.g. milk, eggs etc (Any 6 x 1mk = 6mks)
- (b) Functions of a gear box
- Provide different forward speed
  - Allows driver to select any forward or reverse gear to suit operation
  - Allows change in speed ratio by altering gears conveniently in gear box
  - Allows driver to stop the tractor without suddenly stopping the engine or without keeping his foot pressed on the clutch (4 x 1mk) = 4mks
- (c) Ways of improving milk production in a herd of dairy goats
- Proper nutrition / proper feeding
  - Proper selection and breeding
  - Proper housing
  - Proper parasite and diseases control
  - Proper hygiene
- 5 x 1m = 5mks
- (d) Essentials of clean milk production
- Healthy milking herd
  - Clean milking cows
  - Healthy and clean milkman
  - Clean milking shed
  - Clean milking utensils
  - Proper milk filtration, cooling and storage
  - Avoidance of flavours in milk
- (Any 5 x 1m) = 5mks
27. (a) Qualities of camels that enable them to survive the harsh conditions of arid and semi-arid areas
- The hump stores fat which is metabolized to produce metabolic water enabling them to survive long periods without drinking
  - Their bodies are highly tolerant to temperature fluctuations and dehydration
  - They are high level browsers i.e. can survive on scanty forage
  - They have highly developed feet and flat hooves enabling them to walk for long distances on sand
  - They have long eyelashes to keep off sand particles and to keep off strong sun's radiation
  - They have a long loop of Henle in their kidneys to increase the surface area for water re-absorption
- (Any 5 x 1 = 5mks)
- (b) Challenges hampering successful poultry production in Kenya.
- Disease attacks
  - Parasite infestation
  - In-availability of quality poultry feeds
  - Expensive poultry feeds and drugs
  - Inadequate technical knowhow
  - Inadequate market for poultry products
  - Competition from other cheaper livestock products e.g. beef
  - Predators
  - Inavailability of electrical power limiting practices like egg incubation and brooding
- (any other relevant point)  
Any 7 x 1mk = 7mks
- (c) Uses of various hand tools in the construction of a cattle dip
- Saws – for cutting rails, posts, timber for roofing to size
  - Mattock – For excavating the dip tank
  - Claw hammer – For driving in and removing nails from wood
  - Spade – For scooping soil during excavation
  - Tinsnips – For cutting roofing iron sheets to size
  - Plump bob – For checking whether walls are vertical
  - Mason's trowel – For placing mortar between joints when erecting walls
  - Wood float/joints when erecting walls – Plastering the walls
  - Steel float – Applying screed on the floor of the dip tank
  - Tape measure – Taking measurement e.g. between posts
  - Soil auger – Making holes for erecting posts
- (Any 8 x 1 = 8 marks) Mark as a whole.

**NANDI NORTH SUB-COUNTY JOINT PRE-MOCK EXAMINATION 2015**

*Kenya Certificate of Secondary Education (K.C.S.E.)*

**AGRICULTURE**

**PAPER 1**

**TIME: 2 HOURS**

**SECTION A (30 MARKS)**

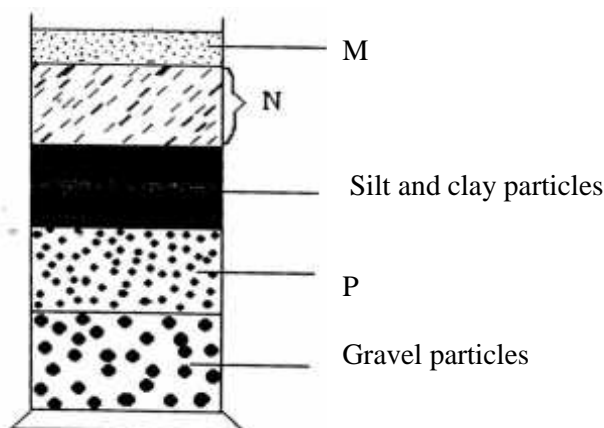
Answer ALL Questions in the Spaces Provided

1. State **two** precautions when handling inoculated seeds. (1mk)
2. State **four** causes of land fragmentation in Kenya. (2mks)
3. Explain the meaning of the following post-harvesting practices carried out in crops such as beans. (½mk)
  - (i) Dusting:.....
  - (ii) Threshing:.....
  - (iii) Cleaning:.....
4. Give **four** characteristics that a good plant used as green manure should possess. (2mks)
5. State **four** ways in which chemical kills the weed in the crop field. (2mks)
6. Outline **three** factors that determine the method of harvesting crops. (½mk)
7. State **three** ways in which crop rotation may improve soil fertility. (1½mks)
8. State **three** ways in which primary tillage destroy soil-borne pests. (1½mks)
9. State **four** ways of improving labour productivity in a tea plantation. (2mks)
10. Give **four** edaphic factors that influence crop production. (2mks)
11. Differentiate between the term afforestation and reafforestation. (1mk)
12. Explain the importance of gapping in crop production. (1mk)
13. State **three** possible solutions to curb the problem of perishability in horticultural crops. (1½mks)
14. Give **three** reasons why an inventory should be updated from time to time. (1½mks)
15. (a) What is meant by the term joint product as used in production economic? (1 mk)
- (b) List **two** joint-products in crop production. (1mk)
16. (a) Mention **three** methods of forage conservation. (1½mks)
- (b) Outline **three** effects of frequent early defoliation. (1½mks)
17. List **three** Financial Documents. (1½mks)
18. Study the following types of vegetable crops:-
  - Cowpeas
  - Spring onion
  - Pigeon peas
  - Pepper
  - Tulips
 Identify:-
  - (i) Leaf vegetable (½mk)
  - (ii) Fruit vegetable (½ mk)

**SECTION B (20 MARKS)**

Answer all questions in the spaces provided in this section

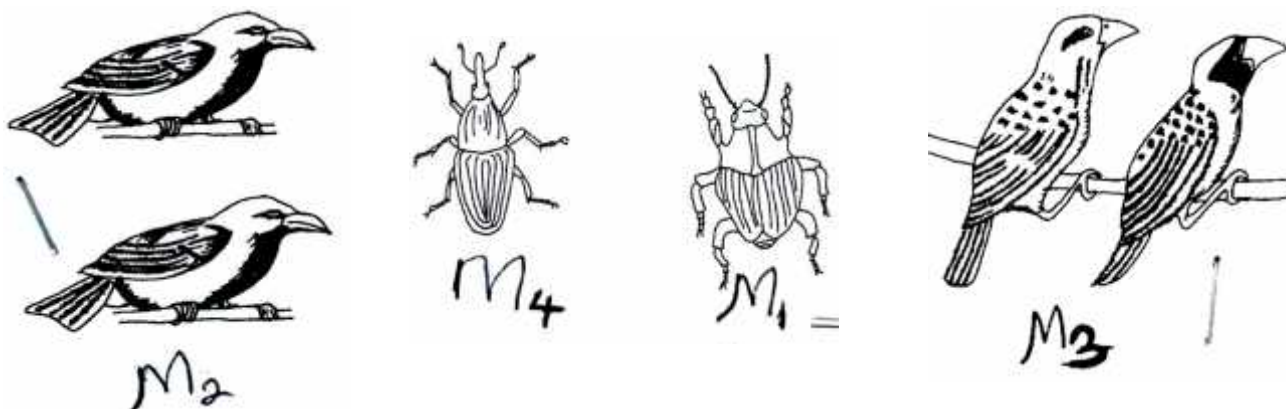
19. The diagram below shows the result of an experiment carried out by a form one student. The student mixed water with sodium carbonate then added in a soil sample after which thorough shaking was done and the contents were left to settle on a bench.



- (a) What was the aim of the above experiment? (1mk)

- (b) Identify the layers represented by M, N and P. (2mks)  
 (c) What was the role of sodium carbonate used in the experiment? (1mk)

20. The diagrams below illustrate both field and storage pests.



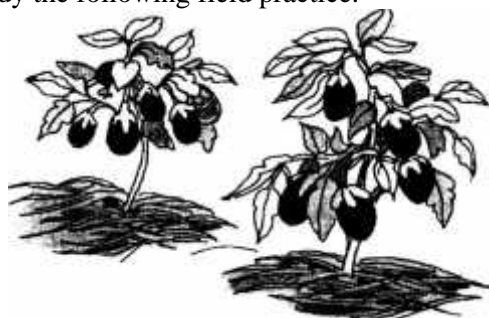
- (a) Identify the pests in the illustration. (1½mark)

M<sub>1</sub>: M<sub>2</sub>: M<sub>3</sub>:

- (b) State **two** ways by which pest labelled M<sub>2</sub> causes loss in cereal crops. (2marks)

- (c) State **three** methods which are used to control the pest labelled M<sub>2</sub>. (2marks)

21. Study the following field practice.



- (a) Identify the practice carried out in the above diagram. (2marks)

- (b) Give **four** reasons for carrying out the above practice. (2marks)

- (c) Outline **two** limitations of the above practice. (2marks)

22. A farmer wishes to change her enterprise from vegetable production to dairy cattle rearing. The costs she incurs in growing of vegetables is as follows:-

|            |         |
|------------|---------|
| Weed       | Sh. 200 |
| Harvesting | Sh. 300 |
| Fertilizer | Sh. 500 |
| Seeds      | Sh. 400 |

When she changes her enterprises to dairy cattle rearing, she incurs the following:-

|                       |          |
|-----------------------|----------|
| Cost of buying cattle | Sh. 5000 |
| Disease               | Sh. 200  |
| Salary of milk person | Sh. 2000 |
| Fencing               | sh. 500  |

The revenue she got when growing vegetable is 10,000.

In dairy production, the revenue she gets from milk sales is Shs. 15,000 and manure sales shs. 1,000.

Draw up the partial budget and indicate the effect of the change. (Show your working) (5marks)

### SECTION C

**Answer any two questions in the spaces provided**

23. (a) Describe the production of beans under the following sub-topics:  
 (i) Planting (2marks)  
 (ii) Field Management Practices. (4marks)  
 (iii) Harvesting. (2marks)
- (b) Outline the safety measures in the use of chemicals to minimize environmental pollution. (8marks)
- (c) Explain **four** qualities of a good silage. (4marks)
24. (a) Explain **five** biological factors that influence soil formation. (10marks)

- (b) Describe the causes of crop diseases. (5marks)
- (c) Describe the field production of tea under frame formation by pegging method. (5marks)
25. (a) Describe the procedure of harvesting sugarcane. (5marks)
- (b) Explain how farmers overcome risks and uncertainties in farm business. (7marks)
- (c) Use the information given in the table below to answer the questions that follow.

| Fertilizer inputs (units) | Potato yield (bags) | Marginal product (bag) |
|---------------------------|---------------------|------------------------|
| 0                         | 50                  | -                      |
| 1                         | 62                  | 12                     |
| 2                         | 66                  | 4                      |
| 3                         | 68                  | 2                      |
| 4                         | 69                  | 1                      |
| 5                         | 69                  | 0                      |

The cost of fertilizer is shs. 320 per unit and the price of potatoes is shs. 200 per bag.

- (i) At what point of fertilizer application should the farmer be advised to stop investing in potatoes?  
(Show your work) (5marks)
- (ii) Give a reason for your answer in (i) above. (2marks)
- (iii) At what level is net revenue highest? (1mark)

**NANDI NORTH SUB-COUNTY JOINT PRE-MOCK EXAMINATIONS 2015**

*Kenya Certificate of Secondary Education (K.C.S.E.)*

443/2

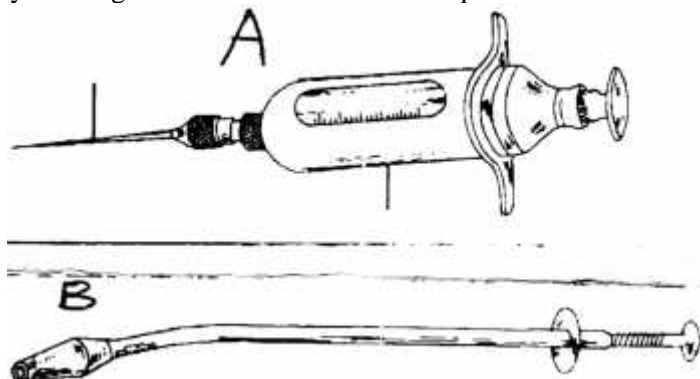
**AGRICULTURE**

**PAPER 2**

**SECTION A (30 MARKS)**

**Answer ALL Questions in the Spaces Provided**

1. State **four** conditions necessary for artificial incubation in poultry production. (2mks)
2. Name **four** Beef cattle breeds. (2mks)
3. Study the diagrams below and answer the questions that follow.

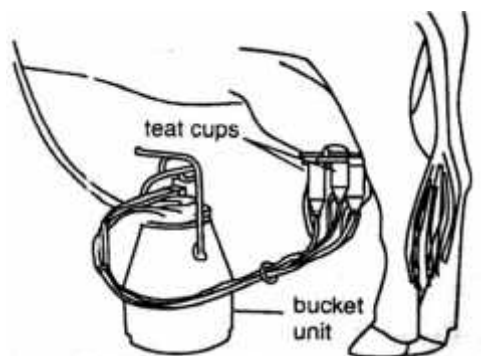


- a. Identify diagrams A and B. (1mk)
- b. Give **two** uses of A. (1mk)
- c. Give the use of tool B. (1mk)
4. State **four** predisposing factors of livestock diseases. (2mks)
5. State **four** functions of corner posts in barbed wire fences. (2mks)
6. (a) Name **three** meat breeds of sheep. (1½mks)
- (b) Name **one** wool breed of sheep. (½mk)
7. Give **four** control measures of tapeworm. (2mks)
8. (a) Name the equipment used in detection of mastitis. (½mk)
- (b) State **four** predisposing factors to mastitis. (2mks)
9. (a) Name **two** Meat Goat Breeds. (1mk)
- (b) Name **one** Hair Goat Breed. (½mk)
10. State **four** preventive measures in disease control in livestock. (2mks)
11. State **four** factors considered when planning for a farm structure. (1mk)
12. Apart from Dipping, give **two** other methods of Acaricide application. (1mk)
13. Give **two** major physical differences between Dromedary and Bactrian camels. (2mks)
14. State **four** disadvantages of a spray Race. (2mks)
15. State **three** advantages of Natural mating. (3mks)

**SECTION B (20 MARKS)**

**Answer all questions in the spaces provided in this section**

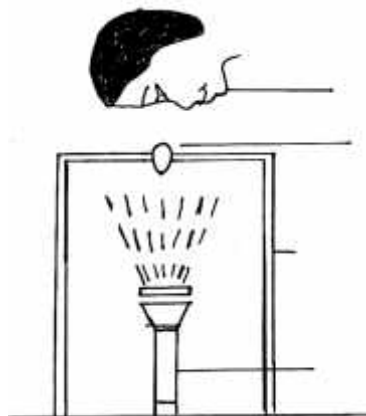
16. Study the diagram below and answer the questions that follow.



- a. Identify the above practice. (1mk)
- b. (i) State the next procedure immediately after the removal of teat cups from the teats. (1mk)
- (ii) Why is it necessary to carry out the procedure in b (i) above? (1mk)
- c. What is meant by the term Dry Cow Therapy? (1mk)



- d. Which hormone is responsible for stimulating milk-let-down? (1mk)  
 e. Why is it not advisable to feed silage to dairy animals just before milking? (1mk)
17. The diagram below shows a certain practice in poultry production.



- a. Identify the above practice. (1mk)  
 b. State **three** abnormalities that can be detected by using the above procedure. (1½mks)  
 c. What is the function of egg yolk? (1mk)
18. (a) Mr. Baraza wanted to prepare a feed ration containing 20% DCP (Digestible Crude Protein). He used oats which contain 12% DCP and Simsim seed cake which contains 50% DCP. Using the Pearson's square method, compute the amounts of oat and simsim seed cake he would use to make a 100kg ration. Show your working. (4mks)  
 (b) What is a ration? (1mk)
19. State **five** harmful effects of ticks in livestock production. (5mks)

### SECTION C

#### Answer any two questions in the spaces provided

20. (a) State **five** advantages of using animal power. (4mks)  
 (b) Give **five** advantages of four-stroke engines. (8mks)  
 (c) State **five** disadvantages of Natural mating in livestock rearing. (5mks)  
 (d) Briefly explain **five** factors considered in siting an Apiary. (3mks)
21. (a) Briefly explain **five** functions of water in the body of an animal. (5mks)  
 (b) (i) Define the term Notifiable disease. (1mk)  
 (ii) Give the causal organism for Anthrax. (1mk)  
 (c) State **five** symptoms of East Coast Fever. (5mks)  
 (d) Give **five** characteristics of Beef Cattle Breeds. (5mks)
22. (a) Give **four** reasons for Dehorning in livestock production. (4mks)  
 (b) Explain **eight** factors to be considered when selecting a breeding stock. (16mks)

**NANDI NORTH DISTRICT  
JOINT PRE-MOCK 2015  
AGRICULTURE PAPER 1  
MARKING SCHEME**

1.
  - Should not come into contact with chemicals.
  - Should be planted when the soil is moist.
  - They should be inoculated with the right strain of rhizobium. (2 x ½ = 1mk)
2.
  - Inheritance
  - Gift or donations.
  - Repayment of debts.
  - People buy piece of land elsewhere.
  - Compensation. (4x½ = 2mks)
3. (i) Applying chemical powders on bean seeds to prevent attack by storage pests.  
(ii) The act of removing beans from the pods.  
(iii) Cleaning of the bean involves removal of chaff through winnowing. (3x½=1½mks)
4.
  - Plant must be capable of rotting quickly.
  - Highly vegetative or leafy.
  - Fast growth.
  - Nitrogen fixing.
  - Resistant to drought.
  - The plant should be hardy. (4x½ = 2mks)
5.
  - Inhibition of nitrogen metabolism.
  - Killing the cell.
  - Causing abnormal tissue development.
  - Inhibiting photosynthesis.
  - Inhibiting respiration. (4x½ = 2mks)
6.
  - The scale of production.
  - The growth habit of the crop.
  - The part to be harvested. (3x½ = 1½mks)
7.
  - Leguminous crops should be included to improve soil fertility.
  - Crops from the same families should be alternated in order to discourage excessive infestation of soil borne pest and disease.
  - The inclusion of a grass ley and this allows for maximum soil disturbance (maintain good soil structure) (3x½=1½mks)
8.
  - Exposes pests to the sun heat / light.
  - Exposes pests to predators.
  - Burying the pest hence starving them. (3x½=1½mks)
9.
  - Training the labour forces.
  - Use of mechanization where possible.
  - Giving labour forces incentive and motivation.
  - Supervision of labour. (4x½ = 2mks)
10.
  - Soil colour
  - Soil structure
  - Soil texture
  - Soil PH
  - Soil depth. (4x½ = 2mks)

11.  
– Afforestation is the planting of trees in an area where trees had never existed while reforestation is the planting of trees where forests have been cleared. (1 x 1 = 1mk)
12.  
– Maintain plant population.  
– Economic use of labour.  
– Economic use of chemical. (well explained) (1 x 1 = 1mk)
13.  
– Process the products.  
– Use cold stores.  
– Sell the produce immediately after production. (3x½=1½mks)
14.  
– Depreciation and appreciation.  
– Purchase and sales.  
– Losses  
– Item written off. (3x½= ½mks)
15. (a)  
This is a situation whereby a farmer aims at producing one product, but automatically ends in getting another products. (1 x 1 = 1mk)  
(b) - Cotton lint and cotton seed.  
- Maize grain and maize stover. (2 x ½ = 1mk)
16. (a) - Hay  
- Silage  
- Standing forage. (3x½=1½mks)  
(b) - A gradual weakening of the pasture stand.  
- Empty patches.  
- Weed invasion.  
- Reduction in the productivity life of the pasture stand. (3x½=1½mks)
17.  
– Invoice  
– Statement  
– Receipt  
– Delivery note  
– Purchase order (3x½=1½mks)
18. (i) Cowpeas (1x ½ = ½ mk)  
(ii) Pepper (1x ½ = ½ mk)
- SECTION B (20 MARKS)**
19. (a) To show that soil is made up of different sized particles. (1 x 1 = 1mk)  
(b) M – Floating organic matter / humus.  
N – Water with clay particles and dissolved mineral salts.  
P – sand. (3 x 1 = 3mks)  
(c) Aid in the dispersion of particles. (1 x 1 = 1mk)
20. (a) M<sub>1</sub> – Bean weevil / bruchid;  
M<sub>2</sub> – Weaver bird;  
M<sub>3</sub> – Quelea bird;  
(b) - Exposes maize cobs to rain leading to rotting.  
- Strip the leaves.  
- damage maize crop during milky stage. (2 x 1 = 2mks)  
(c) - Trapping  
- Destroying the nest.  
- Poisoning  
- Scaring. (3x½=1½mks)
21. (a) Mulching. (1 x 1 = 1mk)  
(b)  
– Conservation of soil moisture.  
– Checks on the growth of weeds by suppressing their growth and smothering them.

- Regulation of soil temperature.
- Control soil erosion.
- Increases the rate of water infiltration. (4x ½ = 2mks)

(c)

- A fire hazard
- Some mulches may become a source of weeds.
- Provide breeding ground for pests.
- Some organic mulch breaks down to cause acidic reaction in the soil. (2 x 1 = 2mks)

22. Partial budget for a farmer.

| DEBIT (-)            | Ksh.         | Cts.      | CREDIT            | Kshs.         | Cts       |
|----------------------|--------------|-----------|-------------------|---------------|-----------|
| Extra costs          |              |           | Extra Revenue     |               |           |
| (i) Buying cattle    | 5000         | 00        | Sales of milk     | 15000         | 00        |
| (ii) Disease control | 200          | 00        | Sales of manure   | 1000          | 00        |
| (iii) Salary         | 2000         | 00        |                   |               |           |
| (iv) Fencing         | 500          | 00        |                   |               |           |
| <b>SUB-TOTAL</b>     | <b>7700</b>  | <b>00</b> | <b>SUB-TOTAL</b>  | <b>16,000</b> | <b>00</b> |
| Revenue foregone     |              |           | <u>Cost saved</u> |               |           |
| Vegetable            | 10000        | 00        | Weed              | 200           | 00        |
|                      |              |           | Harvesting        | 300           | 00        |
|                      |              |           | Fertilizer        | 500           | 00        |
|                      |              |           | Seeds             | 400           | 00        |
| <b>TOTAL</b>         | <b>17770</b> | <b>00</b> |                   | <b>17400</b>  | <b>00</b> |

$$\begin{aligned}
 (\text{Extra Revenue} + \text{Cost saved}) & - \text{Extra cost} + \text{revenue foregone} \\
 & = 17,400 - 17,770 \\
 & = -370
 \end{aligned}$$

The farmer should not replace vegetable with dairy.

**SECTION C**23. (a) (i) Planting

- At onset of rains.
- Delaying planting in long rain.
- Place 2 or 3 seeds / hole.
- Apply DAP / phosphate fertilizer.
- Seed rate 50 – 60 kg / ha. (2 x 1 = 2mks)

(ii) Field practices

- Weeding
- Irrigation
- Disease control
- Gapping
- Thinning (4 x 1 = 4mks)

(iii) Beans for seeds are harvested by uprooting the dry plant.

- Uprooting done in the morning.
- Uprooted plant may be gathered on mats.
- Beaten with sticks to remove the seeds from the pods.
- Yield of about 2600kg/ha. (2x1 = 2mks)

(b)

- The user should avoid herbicide drift to unintended crops and other plants.
- Drift to animal feeds and water should be avoided.
- Any leftovers and empty containers must be properly disposed.
- Spraying equipment must not be washed in water sources which are used by animals and human.
- All chemicals must be stored in safe places out of the reach of children and away from food.
- Equipment used in spraying herbicides must be thoroughly washed.
- Do not spill herbicide in place such as pasture and fodder crops. (8 x 1 = 8mks)

(c)

- High quality forage cut at the proper stage of growth.
- Have a PH of 4.2 or below.

- Have 5 to 9% lactic acid.
- Be free of moulds and bad colour such as ammonia and butyric acid.
- Have a fine texture with no slimina. (4 x 1 = 4mks)

24. (a)

- Micro-organism such as bacteria and fungi decompose dead organic matter.
- Termites and earthworms feed on dead organic remains and add humus to the soil.
- Roots of growing plant forces their way into the rock causing cracks.
- Animals break the rock by their movement and burrowing.
- Man's activities e.g. cultivation, mining and road construction. (5 x 2 = 10mks)

(b)

- Diseases causing organisms, bacterial fungi.
- Poor weather condition.
- Toxic chemical in the soil.
- Irregular watering may cause physiological disorders.
- Flooding may accumulate ammonia that is poisonous.
- Nutritional disorders – deficiency symptoms of plant nutrients. (5 x 1 = 5mks)

(c)

- After the seedling has attained a height of 30cm.
- Cut back the main stem to 15cm above the ground.
- Allow lateral branches to grow to about 50 – 70cm.
- Then peg the branches at slanting angle 30 – 45°.
- Tip off the tips pegged branches. (5 x 1 = 5mks)

25. (a)

- Sample the sugarcane in the farm and send to the factory for testing the quality.
- When the cane is tested to be matured start harvesting by cutting the cane at ground level.
- The top of the cane is removed to avoid growth substances flowing back and lowering the quality of sugar.
- The leaves are stripped using cane, harvesting machetes.
- The cane is transported to the factory immediately. (5 x 1 = 5mks)

(b)

- Insurance – insuring the enterprise to be compensated.
- Diversification – having several enterprises and product safeguard.
- Selecting of more certain enterprises (with low risks).
- Contracting – growing crops on contract with the consumer.
- Input rationing – use sparingly to avoid waste.
- Flexibility production – being able to make alternative in farming. (1 x 7 = 7mks)

| FER(Input) | Maize yield | TR     | TC   | MR   | MC  | NR     |
|------------|-------------|--------|------|------|-----|--------|
| 0          | 50          | 10,000 | -    | -    | -   | 10,000 |
| 1          | 62          | 12,400 | 320  | 2400 | 320 | 12,080 |
| 2          | 66          | 13,200 | 640  | 800  | 320 | 12,560 |
| 3          | 68          | 13,600 | 960  | 400  | 320 | 12,640 |
| 4          | 69          | 13,800 | 1280 | 200  | 320 | 12,520 |
| 5          | 69          | 13,800 | 1600 | 0    | 320 | 12,200 |

(i) At the end of the third unit of fertilizer application.

(ii) This is the last profitable point of fertilizer application when the marginal revenue (Ksh. 400) is higher than the marginal cost (Ksh. 320).

If the farmer continued to add the fourth unit of fertilizer, he would be at a loss of Kshs. 120.

(iii) Net revenue is highest at the same point 3<sup>rd</sup> unit of fertilizer application at kshs. 12640.

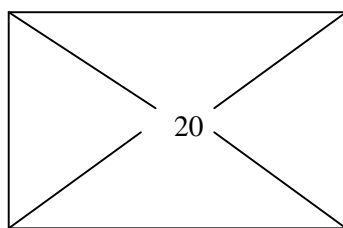
**NANDI NORTH DISTRICT JOINT PRE-MOCK 2015****443/2****AGRICULTURE****PAPER 2****MARKING SCHEME**

- 
1. Four conditions necessary for artificial incubation in poultry production.
- Temperature between  $37.5^{\circ}\text{C} - 39.4^{\circ}\text{C}$ ;
  - Fresh air / ventilation;
  - Relative humidity of about 60%;
  - Egg turning; (4 x ½ = 2mks)
2. Four beef cattle breeds
- Arbederes Angus
  - Galloway
  - Hereford
  - Beef short horns;
  - Charolais
3. Diag A – Hypodermic needle and syringe.  
Diag B – Bolus gun.
- (b) Two uses of A.
- Injecting medicines and vaccines into animal; (½ mk)
  - Extracting blood samples for laboratory analysis; (½ mk)
- (c) Give the use of tool B
- Shooting solid drugs through the mouth of an animal. (1 x 1 = 1mk)
- 4.
- Species of the animal;
  - Breed of the animal;
  - Age of the animal;
  - Sex of the animal;
  - Colour of the animal; (4 x ½ = 2mks)
- 5.
- Promote growth;
  - Help in blood clotting;
  - Help in bone formation;
  - Help in innocular activity;
  - Prvent diseases in animals;
  - Act as organic catalyts in various metabolic and physiological reactions. (4 x ½ = 2mks)
6. (a)
- Dorper;
  - Blackhead Persian;
  - Red Maasai sheep; (3 x ½ = 1½mks)
- (b)
- Merino; (1 x ½ = ½ mk)
7. Four control measures of tapeworm.
- Proper meat inspection;
  - Proper cooking of meat;
  - Keep animal houses clean and disinfected;
  - Use of prophylactic drugs such as anti-helminthes or dewormers to kill parasites in animals;
  - Practice rotational grazing;
  - Keep the feeding and watering equipment clean; (4 x ½ = 2mks)
8. (a) Strip cup;
- (b)
- Age
  - Stage of lactation period.
  - Pendulous udder and long teats
  - Incomplete milking
  - Mechanical injuries
-

- Poor sanitation  
– Poor milking technique. (4 x ½ = 2mks)
9. (a)  
– Galla;  
– Boer (2 x ½ = 1mk)
- (b) One Hair Goat Breed  
– Angora Goat (1 x ½ = ½ mk)
10. Four preventive measures in disease control in livestock.  
– Isolation of sick animals;  
– Imposition of quarantine;  
– Prophylactic measures and treatment;  
– Slaughter of affected animals;  
– Use of antiseptics and disinfectants;
11. Four factors considered when planning for a farm structure.  
– The size of the enterprise.  
– The potential for expansion;  
– Accessibility;  
– The various farm activities to be carried out. (4 x ½ = 2mks)
12. Two other methods of Acaricide application.  
– Spraying;  
– Hand dressing using pyegrease; (2 x ½ = 1mk)
13. Two major physical differences between dromedary and Bactrian camels.  
– Dromedary has one hump while Bactrian has two humps;  
– Dromedary has low amount of fur while Bactrian has a lot of fur. (2 x 1 = 2mks)
14. Four disadvantages of a spray race.  
– High operational cost;  
– Requires highly skilled labour;  
– Only economical with a large herd;  
– Nozzles tend to clog with dirt in wash; (4 x ½ = 2mks)
15. Three advantages of Natural mating.  
– More accurate as the male can detect when the female is on heat;  
– Less laborious as there is no need of checking the animals for heat signs;  
– Useful when heat periods of females cannot easily be detected. (3x½ = 1½mks)
- SECTION B (20 MARKS)**
16. (a) Machine milking. (1 x 1 = 1mk)  
(b) (i) Hand stripping of teats. (1 x 1 = 1mk)  
(ii) Why it is necessary to carry out the procedure in (b) (i) above.  
– To prevent mastitis  
– To prevent the cow from drying off too soon; (any correct answer)  
(c) Dry cow therapy is the application of mastitis control antibiotic into the teat canal after drying off the cow;  
(d) Hormone responsible for stimulating milk-let down.  
– Prolactin  
(e) Why it is not advisable to feed silage to the dairy animals just before milking.  
– It leads to milk tainting. (1 x 1 = 1mk)
17. (a) The practice  
– Egg candling (1 x 1 = 1mk)  
(b) Three abnormalities that can be detected by using the above procedure.  
– Blood spots on yolk;  
– Hair cracks on shell;  
– Breakage on egg shell;  
– Very porous shell; (3 x 1 = 3mks)  
(c) The function of the yolk of an egg  
– Contains food reserves for the developing chick. (1 x 1 = 1mk)

18. (a)

Oats 12% DCP



30 parts of Oats;

Simsim seed  
Cake 50%08 parts of simsim seed cake;  
Total 38

$$\frac{30}{38} \times 100\text{kg} = 78.9\text{kg of oats;}$$

$$\frac{08}{38} \times 100\text{kg} = 21.1\text{kg of simsim seed cake.}$$

(b) Ration is the daily amount of food given to an animal to cater for both maintenance and production requirement;

19. Five harmful effects of ticks in livestock production.

- Vectors of livestock disease e.g. ECF;
- Suck blood leading to anaemia;
- Their bites cause wounds which acts as routes for secondary infections;
- Cause irritation to the animal through their bites;
- Bites lower the value of hides and skins;
- Some ticks produce toxins that may cause adverse effects on the host. (any 5x1 = 5mks)

**SECTION C**

20.

(a) Five advantages of using animal power.

- It does not require skilled workers;
- They are cheaper to buy and maintain;
- Work output from animals is higher than that of human beings;
- Animals can work in areas where it would be impossible for tractors.
- Animals work better on small holdings than tractors. (any 5x1 = 5mks)

(b) Five advantages of four-stroke engines.

- The engines produce high power and can do heavy farm work.
- Have efficient fuel and oil utilization.
- Perform a wide range of farm operations.
- Engines are efficiently cooled with water thus allowing the production of large engine sizes.
- The exhaust gases are effectively expelled from the cylinders; (any 5x1 = 5mks)

(c) Five disadvantages of natural mating in livestock productions.

- There is a high chance of inbreeding;
- Possible to transmit breeding diseases;
- Males will need extra pasture to eat that would have been used by the females;
- Large males can injure small females.
- A lot of semen is wasted as a single ejaculation produces semen that can serve several cows.
- It is cumbersome and expensive to transport a bull to hot areas to serve cows. (any 5x1 = 5mks)

(d) Five factors considered in siting an Apiary.

- Availability of water – where water is not available in a 3km radius, sugar solution / syrup is placed close to the hives in containers.
- Availability of flowers – flowers provide nectar and pollen necessary for honey formations.
- A sheltered place – Bee hives should be protected from strong sun and wind.
- A place which is free from noise and other disturbances.
- Away from human beings and livestock and busy roads as bees can sting and cause pain / death. (any 5x1 = 5mks)

21.

(a) Five functions of water in the body of an animal.

- It is a compound of body cells and many body fluids; e.g. blood;



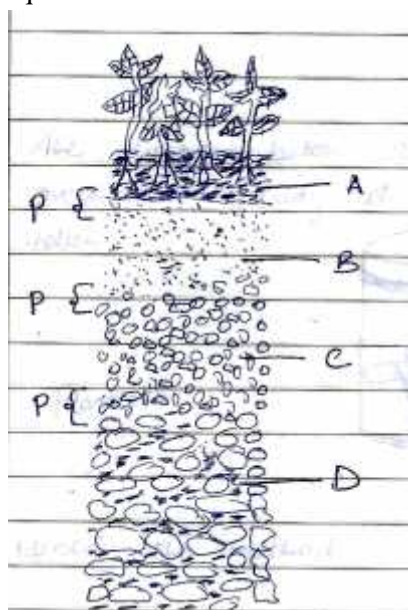
- It is responsible for the transportation of nutrients from one part of the body to another;
  - Makes cells turgid, maintaining the shape of the body cells.
  - Used in biochemical reactions in the body e.g. digestion of food.
  - Helps to regulate body temperature through sweating and evaporation.
  - Helps in the excretion of waste products from the body,
  - It forms part of animal products e.g. milk. (5 x 1 = 5mks)
- (b) (i) Notifiable disease is a disease whose occurrence must be reported immediately to the nearest government authorities. (1 x 1 = 1mk)
- (ii) Causal organism for Anthrax.  
Bacillus anthracis; (1 x 1 = 1mk)
- (c) Five symptoms of East Coast Fever.
- Swollen lymph nodes;
  - Animal develops a high temperature / fever;
  - Animal produces a lot of saliva;
  - Lachrimation / a lot of tears out of the eyes;
  - Animal has difficulty in breathing (due to fluid accumulation in lungs);
  - Haemorrhages in the vulva and the mouth;
  - Coughing;
  - Sight impairment; (any 5x1 = 5mks)
- (d) Five characteristics of Beef cattle breeds.
- Blocky / rectangular / square in shape;
  - Deep well fleshed bodies;
  - Grow fast leading to early maturity;
  - Efficient converter of food into meat;
  - Able to maintain good weight even during adverse conditions;
  - Good foragers;
  - Tolerant to high temperatures;
  - Breed regularly;
  - More resistant to diseases;
  - Short strong legs to support their heavy bodies; (any 5 x 1 = 5mks)
- 22.
- (a) Four reasons for dehorning in livestock production.
- Prevent livestock from inflicting injuries on each other.
  - To make the animal docile and easy to handle;
  - For easy transportation and feeding;
  - Prevents destruction of farm structures; (any 4x1 = 4mks)
- (b) Eight (8) factors considered when selecting a breeding stock.
- Age: young animals, those that have parturated for not more than three times should be selected;
  - Level of performance: only those animals with the highest production level should be selected.
  - Physical fitness: Animals selected should be free from physical defects (e.g. mono eyed, limping)
  - Body conformation: Animals are selected based on their proper body conformation for the desired type / breed;
  - Temperament / Behaviour: Animals selected should not have undesirable behaviours (such as aggressiveness, cannibalism, egg eating).
  - Quality of production: select animals that give high quality products e.g. wool with pure white colour.
  - Mothering ability: select animals with good natural instinct towards young ones;
  - Adaptability: animals selected should be well adapted to the prevailing climate conditions in the area.
  - Prolificacy: animals selected should have ability to give birth to many offspring at a time / Have regular breeding;

**GATUNDU SOUTH FORM FOUR 2015 EVALUATION EXAM****443/1****AGRICULTURE****PAPER1****SECTION A (30 MRKS)**Answer all question in this section in the space provided

1. Differentiate between olericulture and pomoculture as used in crop production . (1mrk)
2. List the physical weathering agents in soil formation process (1½ mrks)
3. Give four method of farming (2mrks)
4. Give two examples for each of the following types of cost incurred in broiler production. ( 2 marks)
- a) Variable cost (2 marks)
- b) fixed cost (2 marks)
5. Give four advantages of crop rotation . (2mrk)
6. State four factors that that should be considered when classifying crop pest (2mrks)
7. Give three reasons why a water logged soil is unsuitable for most crops (1½mks)
8. Give four advantages of tissue culture (2mrks)
9. Outline four observable indicators of economic development of a nation (2mrks)
10. Outline four indicators of well decomposed manure (1½mks)
11. Give two conditions where opportunity cost does not exist (2mrks)
12. Give four management practice that promote high herbage yields in pasture production (2mrks)
13. Give three reasons why primary cultivation should be done early before the onset of the rains (1½mks )
14. Give two examples of farm records that are general in nature . (1mrk)
15. Give four role of nitrogen in plants (2mrks)
16. Give four benefits of possessing a land title deed (2mrks)

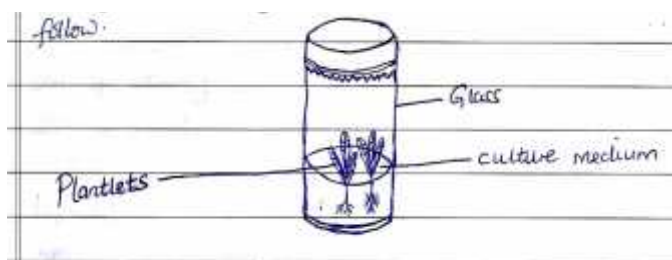
**SECTION B (20 MRKS)**Answer all the questions in this section in the spaces provided

17. The diagram below illustrates a feature observed after digging the soil several metres deep Study the diagram carefully and answer the question that follow



- a) Identify the feature that the diagram above represents in the study of soil (1mrk)
- b) What is the name given to the part labeled p (1mrk)
- c) Give a reason why part b is also reffered to as layer of accumulation (1mrk)
- d) State two ways in which the knowledge of the above feature would be of benefit to farmer (2mrks)

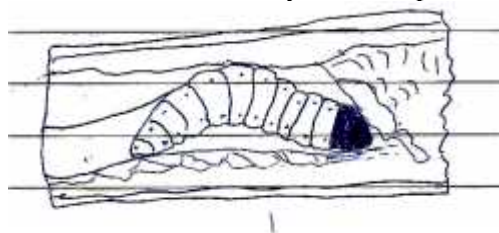
18. The diagram below shows a method of crop propagation .Study it and answer the questions that follow



- Identify the method (1mrk)
  - Name two crops that can be propagated using this method. (1mrk)
  - Give three ingredients used when preparing the tissue culture. (1 ½mks)
19. The following information was obtained from the records of Mr Juma's farm for the year ended on 31<sup>st</sup> march 2011

| Particulars            | kshs    |
|------------------------|---------|
| Opening Valuation      | 100,000 |
| Calves                 | 72,000  |
| Hired Labour           | 21,000  |
| Sales of milk          | 13,000  |
| Sales of cereals       | 33,000  |
| Rent                   | 9,000   |
| Feed                   | 5,300   |
| Seed                   | 1,700   |
| Fertilizers            | 4,700   |
| Sales of Vegetables    | 9,300   |
| Sales of poultry       | 1,800   |
| Sales of fruits        | 700     |
| Pesticides             | 1,250   |
| Depreciation           | 650     |
| Repair and Maintenance | 950     |
| Interest on loans      | 200     |
| Closing Valuation      | 9,0000  |

- using the information given above , prepare a profit and loss account for Mr Juma's farm for the year ended 31<sup>st</sup> March (7mrks)
  - Giving a reason, State whether Mr. Juma's farm made a profit or loss (½ mark )
- 20 The diagram below shows a maize stalk infected by a certain pest .Study it and answer the questions that follow .



- Identify the pest (1/2mks)
- Apart from maize, name another crop attacked by the pest named above ( ½ mark)
- Give three cultural measures that can be applied to control the pest (3mrks)

### **SECTION C ( 40MARKS)**

**Answer any two questions in this section in the spaces provided**

- Describe six advantages of rotational grazing (6mrks)
  - Explain eight ways in which soil fertility can be maintained (8mrks)
  - Explain six factors considered when drawing a farm plan (6mrks)
- Explain the factors that influence the type of irrigation to be used in a farm (8mrks)
  - Explain six reasons for pruning coffee. (6mrks)
  - Describe 6 ways in which lab our productivity can be improved on a farm (6mrks)
- Describe five importance of agro -forestry in soil and water conservation (6mrks)
  - Describe the procedure of silage making (10mrks)
  - Describe five effect of over application of nitrogenous fertilizer. (5mrks)

**GATUNDU SOUTH FORM FOUR 2015 EVALUATION EXAM**

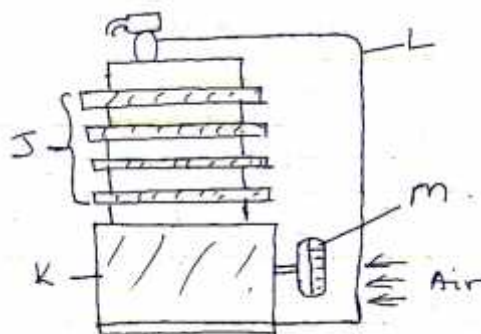
443/2

**AGRICULTURE****PAPER 2****JULY /AUG.2015****2HOURS****SECTION A 30MRKS**Answer all the questions in this sections in the spaces provided

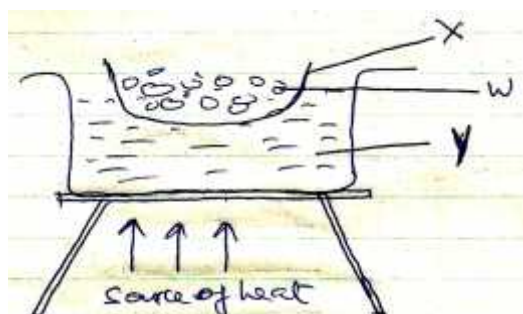
1. Name the most appropriate tools used in the following operations
  - a) Removing metal chippings in file (1mark)
  - b) Cutting wood along grains (1mark)
  - c) Branding (1marks)
2. State four characteristic of Boran cattle (2marks)
3. State two functions of a useful bacteria in livestock production (1mark)
4. Name four function of lipid in an animal body (2marks)
5. State two ways of reducing friction in moving part of farm tool (1mark)
6. Outline four types of fence that can be used in mixed farm (2marks)
7. Name three methods of out breeding in livestock production. (1 ½ marks)
8. Give two reasons for tailing in sheep production (1mark)
9. Name any five internal parts of cow's udder (2 ½ marks)
10. Give five ways of transmitting livestock diseases (2 ½ marks)
11. Give four features of improved grain bin (2mrks)
12. Give three types of calving complications (1 ½ marks)
13. State four advantages of zero grazing as a grazing system (2marks)
14. State two functions of a queen bee in a colony (1mark)
15. Name four symptoms of anaplasmosis in livestock (2marks).
16. What do you understand by the following terms as used I animal production .
  - a) Coponisation (1mark)
  - b) Bullock (1mark)
  - c. Epistasis (1mark)

**SECTION B (20Mrks)**Answer all the questions in the spaces provided

17. Below is a diagram of a cooling system .Study it and answer the questions that follow



- a) Identify the type of cooling system illustrated (1mrk)
  - b Name parts labelled J, K , L and M (2mrks)
  - c. Name two problems associated with the type of cooling system illustrated above (2mrks)
18. Below is an illustration of a method of extracting honey from combs .Study the diagram and answer the question that follow .



- a) Identify the above method of extracting honey (1mrk)  
 b) Give a reason why container x should not be heated directly (1mrk)  
 c) Name the parts labeled w and y (2mrks)  
 d) Besides the above method, State one other method of extracting honey (1mrk)
- 19 The diagram below shows a certain practice carried out on pig



- a) Identify the practice illustrated above (1mrk)  
 b) Draw another illustration depicting pig number 37 (1mrk)  
 c) Name the tool used to carry out the practice illustrated above (1mrk)  
 d) State two other method of indentifying piglet (2mrks)
- 20 .Below is an illustration of a farm operation .Study it carefully and answer the question that follow.



- a) Identify the activity being carried out (1mrk)  
 b) Give one other activity carried on the animal before the above operation is carried out (1mrk)  
 c) Outline the procedure of carrying out the above operation (3mrks)

### **SECTION C**

#### **Answer any two questions in the space provided**

21. a) Outline management practice carried out in a fish pond to ensure maximum harvest of fish (7mrks)  
 b) Discuss the importance of farm mechanization (6mrks)  
 c) Discuss the short term maintenance practices carried out on a tractor (7 marks)
22. a) Explain the feature of a piggery unit (10mrks)  
 b) Explain the factor that influence the work output of a draught animal (10mrks)
23. a) Outline various method of controlling ticks (10mrks)  
 b) Describe the management of growers up to the point of lay (10mrks)

**GATUNDU SOUTH EVALUATION 2015 EXAMINATION**  
**AGRICULTURE**  
**PAPER 1**  
**443/1**

**MARKING SCHEME**

**SECTION A (30 MRKS)**

1. Difference between olericulture and pomoculture
  - Olericulture –Growing of flowers
  - Pomoculture –growing of fruits
2. Physical weathering agent
  - Wind
  - Water
  - Temperature changes (1 ½ mrks)
  - Moving ice /glaciers
3. Methods of farming
  - Mixed farming
  - Nomadic pastoralism
  - Shifting farming
  - Organic farming
  - Agro-forestry
4. Variable and fixed cost in broiler production
  - a) Variable cost
    - cost of the feed
    - cost of drug
  - b) Fixed cost
    - Cost of feeders and waterers
    - Cost of structure/Depreciation of poultry house
    - Cost of chicks
5. Advantages of crop rotation (2mrks)
  - Improve soil structure
  - Control soil borne pest and diseases
  - Ensure maximum utilization of farm labour (2mrks)
  - Aids in weed control
  - Improve soil erosion
  - Security in case of failure on one crop
  - Add nitrogen through N-fixation by Rhizobium bacterial when legume are included
6. Factors considered when classifying crop pests
  - Crop attacked /mode of felling
  - whether field /storage pest/stage of attack (2mrks)
  - Crop part attacked
  - Science classification e.g. insect mite, rodent
7. Reasons why water logged soil is unsuitable for most crops (1 ½ marks)
  - It is not aerated (as water expels air)
  - It lacks micro-organism
  - It is always acidic
  - Low temperature
8. Advantage of tissue culture (2mrks)
  - Used to establish pathogen free plant
  - Used in mass production of propagules
  - It is fast and require less space than use of cutting
  - Used to propagate plants that don't produce seeds
9. Observable indicators of economic development of a nation (2mrks)
  - Development of infrastructure
  - Housing status of the citizen
  - Increase in recreation facilities
  - Ratio of teachers to students

- Improvement in the level of technology
- Number of patients per doctor (more illustration )
- 10 Three indicators of well decomposed manure (1 ½ mrk)
  - Absence of bad odour
  - Material are light in weight
  - Manure is blown in colour
- 11. Condition where opportunity cost does not exist (2mrks)
  - where there are no alternative
  - If anything is given for free
- 12 Management practices that promote high herbage yield in pasture production (2mrks)
  - Top dressing
  - Reseeding
  - Topping
  - Pest control
  - Controlled grazing
- 13. Reasons why primary cultivation should be done early before the onset of the rains. (1 ½ marks)
  - Give time for the soil organism to act on organic mater
  - Allow gaseous exchange to take place thus carbon dioxide diffuses out of the soil .
  - Allows other operations to take place in time .
- 14 Two examples of farm records that are general in nature (1mrk)
  - Production records
  - Inventory
  - Field operation records
  - Breeding records
  - Feeding records
  - Heath record
  - Marketing record
  - Labour record
- 15. Roles of nitrogen in plants (2mrks)
  - vegetative growth
  - Chlorophyll formation
  - Build up of protoplasm
  - Improves leaf quantity in leaf crops such as tea and cabbage
- 16. Benefits of possessing a land title deed to farmer .(2mrks)
  - Can be used as security for credit
  - Encourage long term investments
  - Reduce land disputes
  - Motivates the farmer to conserve soil and water

### **SECTION B (20 MRKS)**

**Answer all the question in this section in the space provided.**

- 17 The diagram below illustrates a feature observed after digging the soil several metres Study it carefully and answer the questions that follow.
- a) Soil profile (1mrk)
  - b) Transitional zone (1mrk)
  - c) Because sometimes minerals are leached from the soil and accumulate in the layer b (1mrk)
  - d) Ways in which the knowledge of the above feature would be of benefit to a farmer (2mrks)
    - Decides what crop to grow
    - How best to cultivate the land
- 18
- a) Tissue culture
  - b) Banana & passion fruits
  - c) Three ingredients used when preparing tissue culture (1½ mrks)
    - Sugar
    - Inorganic minerals
    - Vitamins

19 a) Profit and loss account for Mr Juma 's farm for the year ended on 31<sup>st</sup> March 2015

| Purchase and expense    |         | Sales and receipts |         |
|-------------------------|---------|--------------------|---------|
|                         | ksh     |                    | Ksh     |
| Opening valuation       | 100,000 | Sales of milk      | 13,000  |
| Calves                  | 72,000  | Sales of cereals   | 33,000  |
| Hired labour            | 21,000  | Sales of vegetable | 9,300   |
| Rent                    | 9,000   | Sales of poultry   | 1,800   |
| Feed                    | 5,300   |                    |         |
| Seed                    | 1,700   | Sales of fruits    | 700     |
| Fertilizer              | 4,700   |                    |         |
| Pesticides              | 1,250   | Closing valuation  | 90,000  |
| Depreciation            | 650     |                    |         |
| Repair and maintenances | 950     |                    |         |
| Interest on loans       | 200     |                    |         |
| Total                   | 216,750 | Total              | 147,800 |
|                         |         | B/F/loss           | 68950   |
|                         |         | Total              | 216,750 |

NB = 1 ½ marks (entries) = 3  
= ½ x 8 = 4

- b) loss (½ mark) 7 marks
- 20 a) Maize stalk borer (½ mark)
- b) millet (½ mrk)
- Sorghum
- Sugarcane
- c) crop rotation (3mrks)
- early planting
  - Rogueing
  - clean seedbed
  - planting clean seeds
  - trap cropping
  - proper nutrition
  - proper spacing
  - timely planting

### **SECTION C (40 MRKS)**

**Answer any two questions in this section in the spaces provided ( 6 marks)**

- 21 a) Six advantages of rotational grazing (6mrks)
- The livestock make maximum efficient use of pasture.
  - It reduces the buildup of pest and diseases.
  - Animals waste is distributed evenly in all paddock or field
  - Excess pasture can be harvested and conserved
  - It is possible to apply fertilizers and control weeds , pest and diseases in the pasture that are not in use
  - It allows a resting period for the pasture to regenerate before been grazed on again (6mrks)
- b) Eighty ways in which soil fertility can be maintained. (8mrk)
- adding manure to the soil to enrich it with nutrients.
  - using inorganic fertilizers which releases nutrients in forms that are readily available to plants.
  - practicing crop rotational to ensure balanced nutrients use.
  - using appropriate tillage, for instance minimum tillage.
  - regulating soil ph though liming
  - controlling soil erosion
  - practicing a forestation and reforestation
  - By irrigation which increases availability and uptake of plant nutrients and reclaims saline soil through mulching
  - By weeding to reduce competition for nutrients.
  - By practicing inter cropping preferably with legume to enhance nitrogen fixation.
- c) Six factors considered when drawing a farm plan. (6mrks)
- size of the land
  - environment factors



- the current trend in labour market
  - farmers objectives and preference
  - possible production enterprises
  - existing market condition and price trends
  - availability and cost of farm inputs
  - government regulation /policy
  - security
  - communication and transport facilities (6mrks)
- 22 a) Factors that influences the type of irrigation to be used in a farm (8mrks)
- topography
  - Soil type
  - type of crop to be irrigated
  - amount of water available
  - distance of the source of water to the field
  - capital available, skill available
  - climate factors of the area
- b) Six reasons for pruning coffee (6mrks)
- To train the plant so that it can have the required shape
  - To remove the diseased and the unwanted parts of a plant such as extra suckers ,leaves ,branches ,flowers or even stems
  - To control cropping
  - To facilitate picking to ease penetration of the s pray
  - To control pest and diseases.
- c) 6 ways in which lab our productivity can be improved on a farm (6mrks)
- Training the lab our force
  - Efficiency supervision of lab our
  - Mechanizing farm operation or providing more efficiencies tool and equipment.
  - Giving incentive such as proper housing, transport, bonuses and medical services.
  - Proper regulation of the workers
  - Assigning task to workers according to their skills, ability and interest.
- 23
- a) Importance of agro forestry in soil and water conservation (6mrks)
- Improve soil fertility though nitrogen fixation
  - add organic matter to the soil which increases water infiltration
  - Acts as wind break preventing wind erosion
  - Provide shade to crop reducing evapotranspiration
  - Trees intercept the rain drop reducing erosion rate
  - Tree roots hold soil particle preventing their movement
- b) Procedure of silage making
- Prepare silo before harvesting the crops
  - Harvest crop at appropriate size
  - Wilt the crop for 6-12hours
  - fill the silo with crop compacting every 10-12 layer
  - Check the temperature regularly to ensure correct ensiling temperature
  - Cover the ensiled material with polythene paper
  - Cover the silo with thick layer of the soil to maintain a ridge/hump to prevent rain water entering the silo
  - Dig a trench all around the silo to drain water away to rain water /seepage.
- c) Effects of over application of nitrogenous fertilizer
- Occurrence of blossom and rot diseases
  - Delayed maturity of plants
  - Fruits crack when young .
  - Grow more vegetative parts and produces less fruits
  - Scorching effective on leaves

**GATUNDU SOUTH EVALUATION 2015 EXAMINATION**  
**AGRICULTURE PAPER 2**  
**443/2**

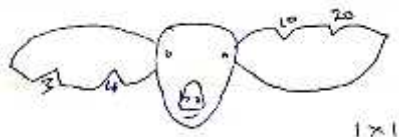
**MARKING SCHEME**

**SECTION A (30MRKS)**

1. Appropriate tools for
  - a) removing metal chippings in the files  
wire brush (1x1) (1mrk)
  - b) Cutting wood along grains  
rip saw 1x1(1mrk)
  - c) Branding  
Branding iron 1x1=1mrk
2. Characteristic of boran cattle
  - Compact, deep and wide body
  - Long, wide, drooping rump
  - Large hump and dewlap
  - Usually white in colour hence radiates heat
  - Slow growth rate and late maturity
  - Resistant to high temperature
  - Cows weigh 410-450kg, bulls 550-650 kg (4x1/2 =2mrks)
  - Used to improve zebu
3. Function of useful bacteria in livestock production
  - Digestive of grass and fibre in the rumen
  - Fermentation of yoghurt/milk products 2x ½ =1mrk
4. Function of lipids
  - Constituent of body cell/part of body cell
  - carries fat soluble vitamins A,D,E, K
  - Insulate body /prevent body heat loss
  - Provide energy stored in reserves 4x ½ (2mrks)
5. Ways of reducing friction in moving parts of farm tools
  - Oiling
  - Greasing 2x ½ =(1mrk)
6. Types of fences used on mixed farm
  - Electric
  - plain wire
  - Barbed wires
  - Wooden fence
  - Woven wire fence/chain link
  - Stone /brick fence/block fence
7. Method of out breeding
  - out crossing
  - Cross breeding
  - Grading up /Up grading 3x1/2=1 ½ mrk
8. Reason for tailing in sheep production
  - Prevent blowfly infection
  - Prevent soiling of wool with urine and feces
  - Facilitate even distribution of fat in the body 2x ½ =(1mrk)
9. Parts of cow's udder
  - Lobule
  - alveolus
  - lobe
  - teat cistern
  - teat canal
  - gland cistern
  - teat sphincter muscles
  - annular fold
10. Ways of transmitting livestock diseases
  - open wounds
  - Body contact with affected animals

- Inhalation of pathogens
  - Insect vectors
  - Ingestion of contaminated food and water
  - Contaminated surgical instruments 5x ½ =2mrks
11. Features of improved grain bin
- Raised above ground
  - Have rat guard on supporting posts
  - Have impermeable wall to guard against rain water .
  - Proper ventilation to control variations.
  - Have proper roofing to protect grain from sunlight and rain 4x1/2=(2mrks)
12. Types of calving complications (3x1/2 =1 1/2mrks)
- Breech presentation
  - One or both forelegs bent backward
  - Head twisted backward to either side
  - Whole reproductive tract twisted
13. Advantages of zero grazing
- high milk yield
  - quick accumulation of manure
  - easy control of parasite and diseases
  - less wastage of feed
  - Large number of animals reared in a small area/allow high stocking rate . 4x1/2=(2mrks)
14. Function of queen bee
- lay eggs
  - Production of pheromone which keeps colony together 2x ½ =(1mrk)
15. Symptoms of anaplasmosis
- constipation/hard dung
  - fever
  - paleness of gum eye lips --Fast breathing and heart beat
  - yellow urine, animal do not chew cud
  - No milk flow from udder 4x1/2=(2mrk)
16. Terms
- a) Caponisation -sterilizing male bird
  - b) bullock –mature castrated male cattle
  - c) Epispalasis-a combination of inferior gene which individually could express themselves
- SECTION B**
- 17.a) Type of cooling system
- Air cooled system 1x1=1mrk
- b) parts
    - J-Finned cylinder
    - K-crank case
    - L-metal cowling
    - M-fly wheel(blower) 4x ½ =(2mrk)
  - c) Problem associated
    - uses heavy lubricating oil which are expensive
    - get hot quickly
    - Cooling not adequate when carrying heavy load 2x1(2mrks)
18. Method of extracting honey
- a) heat method
  - b) Why x should not be heated directly
    - To prevent destroying honey by heat 1x1=(1mrk)
  - c) Parts
    - W-Honey combs
    - Y-water 2x1=(2mrks)
  - d) Other method of honey extraction
    - Crushing and straining
    - Centrifugal method 1x1=1mrk
- 19 a) practice illustrated
- Ear notching 1x1=1mrk

b) Illustration for number 37



c) Other method of identifying piglet

- Ear tagging
- Ear tattooing

2x1=(2mrks)

20

a) activity shown

Hand milking

1x1=(1mrk)

b) Activity carried out before the operation

- Restraining animal
- Providing food
- Washing udder of animal
- wiping udder dry
- Testing for mastitis

1x1=(1mrk)

c) Procedure of carrying out practice

- (i) Assemble milking equipments
- (ii) Provide food
- (iii) Put cow in milking shed and restrain it
- (iv) Wash udder using warm water
- (v) dry the udder with clean towel
- (vi) Use strip cup to test mastitis
- (vii) Milk animal /strip the teat dry
- (viii) Dip teats in antimastitis solution
- (ix) Apply milking jelly /milk salve on teats
- (x) Release cow

3x1=(3mrks)mark as whole

Stop marking where procedure is broken

### SECTION C (40 MRKS)

21. a) Management practice on a fish pond to ensure maximum fish harvest

- Control stocking rate
- Control water pollution
- Supply adequate food regularly
- Provide appropriate feed
- Ensure constant in flow and out flow of water /aerate water
- Control predators
- Harvest fish at the correct maturity age .
- Maintain appropriate water level always

7x1=7mrks

b) Importance of farm mechanization

- Farm operation are achieved on time
- Large areas can be covered within short time
- Reduce drudgery /makes work easier and enjoyable
- Increased efficiency /better job done mechanically
- High yield due to timely operation
- Pest and disease outbreak controlled in a shorter time
- Encourage farmer to consolidate land
- Farmer benefit from economic of scale
- Uses less labour

6x1=6mrks

c) Short term maintenance practice on a tractor

7x1=(7mrks)

- Check level of engine oil using a dip stick
- Check fuel tank to ensure there is enough fuel
- Check level of electrolyte in battery and adjust accordingly
- Check level of water in radiator and top if necessary .
- Grease /oil moving parts
- Check for belt tension and condition and adjust accordingly
- Check the air cleaner to ensure there is no dirt /check level of oil
- Check the tyre pressure before work and adjust accordingly

- Tighten loose nuts ,bolt and pins
- Remove dirt from sediment bowl

22

a) Features of a piggery unit

- Farrowing pen; to ensure safe farrowing and safety of piglet; hence should be provided with farrowing crates and heat source;
- Gilt pen; for keeping young female up to service age
- Boars pen; for breeding boar should be spacious for exercise
- Weaners pen; to house piglet after weaning
- In pig pen; for pregnant sow awaiting farrowing
- Running yard; for sunbathing and dunging
- Feed store for storing pig feed
- Water trough; for watering pigs
- Record room; for keeping feed and weight records
- Roofing; for their protection against extreme weather conditions.
- Feed troughs; for feeding pigs. (10x1=(10mrks)

b) Factors that influences the work of the output of a draught animal

- Age of the animal –very young and very old have lower out put compared to mature animal
- Level of training –Well trained animals are more efficient than poorly trained ones –They are able to follow simple instructions
- Method or harnessing –Well harnessed animal are more efficient than poorly harnessed animal
- Body condition – A well fed draught animal is strong and healthy hence it has a higher work output compared to one that is poorly fed
- Weather condition –Adverse temperature (very high ,very low reduces the work output of draught animal .The animal work best under suitable weather condition
- Duration/ hours of work –Overworked animals tend to have a low work output ,draught animal should be given sufficient time to rest
- Condition of working implement, well maintained Implement are easy to work with and this improves the work output of the animal Any 5x2=(10mrks)

23.

a) Methods of controlling tick (10x1= (10mrks)

- Use of natural enemies e.g. ants and birds
- Self licking to dislodge ticks
- Burning infected pastures land to expose eggs to the sun
- Top dressing pastures with lime
- Fencing off pasture land.
- Keeping animals away from infected pasture to stave ticks .
- Rotational grazing help to break life cycle .
- Deticking from livestock and killing them .
- Spraying with acaricides or dipping in acaricides
- Hand dressing using pye-grease.

b) The management of grower up to the point of lay

- Feed the grower on adequate growers mash per bird per day .
- Supplement the grower s mash with grains and greens .
- Introduce soluble grit /oyster shells at 20<sup>th</sup> week
- Provide adequate clean water and libitum.
- Adjust floor space; allowance; as the bird age appropriately
- Give a booster vaccine against new castle disease at 20 weeks of age at the 18<sup>th</sup> week ,vaccinate against fool pox
- Drench the birds regularly against internal parasites.
- Dust the bird with the appropriate pesticides against external pests .
- Control predator such as rat /cats .
- Feeders and waterier should be cleaned and disinfected daily .
- Maintain foot bath at the entrance of the poultry house .
- Keep the litter as dry as possible /turning it regularly .
- Introduce the layer mash from the 18<sup>th</sup> week and increase gradually .
- Provide roosts /perches for the birds to perch on from the 9<sup>th</sup> week .
- Birds start laying at 18-21 weeks of age depending on the breed . Any 12x1=12mrks)

**MACHAKOS COUNTY KCSE TRIAL AND PRACTICE EXAM 2015***Kenya Certificate of Secondary Education (K.C.S.E)*

443/1

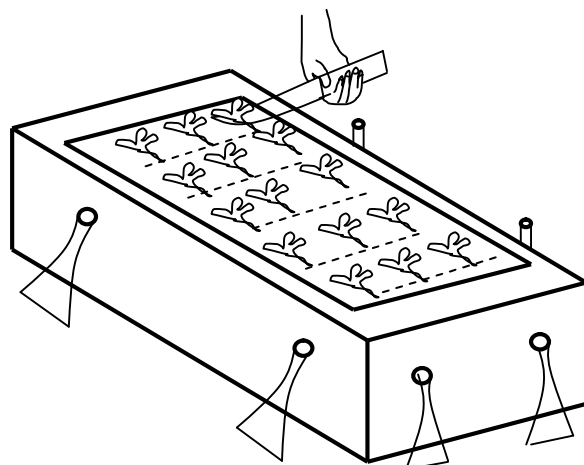
**AGRICULTURE****PAPER 1****TIME: 2 HOURS****SECTION A (30 MARKS)**Answer all the questions in this section in the spaces provide.

1. What is meant by the following terms
  - (a) Under sowing. (1mark)
  - (b) Over sowing. (1mark)
  - (c) Ammonification. (1mark)
2. State four qualities of a scion for use in vegetative propagation materials (2marks)
3. Give two advantages of compound fertilizer. (2marks)
4. State four effects of soil depth on crop production. (2mark)
5. Give four ways of improving sandy soils. (2marks)
6. State two reasons for rolling in wheat crop productivity. (2marks)
7. Give four roles of cost agricultural economics. (2 marks)
8. State two effects of varying spacing in maize production. (1 mark)
9. State three financial documents in agricultural production. (1½ marks)
10. Give four disadvantages of concession land tenure systems. (2 marks)
11. State five symptoms of viral diseases in crop production. (2½ marks)
12. Give four factors that are considered when selecting a nursery site. (2 marks)
13. Distinguish between seed dressing and seed inoculation. (2 marks)
14. Give three reasons for cutting back in pyrethrum. (1½ marks)
15. Give five ways in which consolidation helps to improve farm management. (2½ marks)

**SECTION B (20 MARKS)**Answer all the questions in this section in the spaces provided.

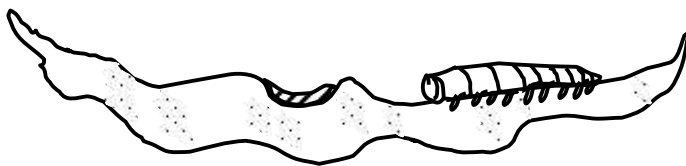
16. i) The following is a farm record Mr. Makau had kept as at 30<sup>th</sup> June 2011. Study it carefully and prepare a balance sheet for the farm. (6 marks)
 

|                  |         |
|------------------|---------|
| Equity loan      | 180,000 |
| Equity overdraft | 24,000  |
| Working tools    | 30,000  |
| Cash at hand     | 15,000  |
| Cash in bank     | 50,000  |
| Buildings        | 60,000  |
| Debtors          | 18,000  |
| Goats            | 48,000  |
| Land             | 70,000  |
| Creditors        | 49,000  |
| Ox plough        | 20,000  |
  - ii) Is Mr. Makau business solvent or insolvent? Explain (2 marks)
17. The diagram below illustrates an agroforestry practice. Study it and answer the questions that follow.



- i) Identify the agroforestry practice illustrated above. (½ marks)  
 ii) State advantages of the practice illustrated above. (3 marks)  
 iii) State three forms of agroforestry. (1½ marks)

18. Study the pest below and answer the questions below.



- a. Identify the pest (1 mark)  
 b. State two methods of controlling the pest. (2 marks)  
 c. Name the crops attacked by the pest. (1 mark)
19. The diagram below illustrates a field management practices in tomatoes



- i) Identify the practice (1 mark)  
 ii) State three reasons for carrying out the practice. (3 marks)  
 iii) Give another practice that could be carried out to give the same results. (1 mark)

### **SECTION C (40 MARKS)**

**Answer any two questions from this section in the spaces provided after question 22**

20. a) State the functions of the Kenya National Federation of Producers in Kenya (5 marks)  
 b) State five factors considered when drawing a farm plan (5 marks)  
 c) Describe the harvesting of cotton (10 marks)
21. a) Describe the production of carrots under the following sub headings  
 b) Seedbed preparation (3 marks)  
 c) Harvesting (4 marks)  
 d) Explain five cultural methods of weed control in bean production. (10 marks)  
 e) Outline three roles of sulphur in crop production. (3 marks)
22. a) Explain the effects of solifluction (6 marks)  
 b) Outline importance of grafting in oranges (4 marks)  
 c) Describe ways of improving labour efficiency (10 marks)

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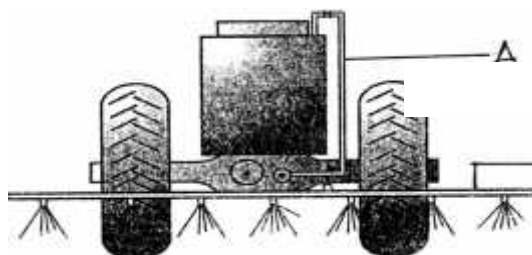
443/2

**AGRICULTURE****PAPER 2****TIME: 2 HOURS****SECTION A (30 MARKS)****Answer all the questions in this section in the spaces provided.**

1. State four heavy breeds in poultry (2 marks)
2. Give two effects of sheep lice infection in sheep production (1 mark)
3. State the advantages of contemporary comparison in selection of livestock. (2 marks)
4. State two reasons tailing in sheep management (2 marks)
5. State two functions of differential in a tractor transmission system. (1 mark)
6. Give four effects of protein deficiency in livestock production. (2 marks)
7. State four predisposing factors of pneumonia in livestock production. (2 marks)
8. Give four factors influencing milk let down in dairy cattle production. (2 marks)
9. Name four instances where animal power is advantageous over other form of powers. (2 marks)
10. State four reasons for handling dairy cattle in livestock production. (2 marks)
11. Give factors considered in choice of rearing systems in poultry production. (2 marks)
12. State four factors that affect the choice of feed stuff in livestock. (2marks)
13. Give four practices carried out on fish before preservation. (2 mark)
14. State four disadvantages of live fence in livestock production. (2 marks)
15. a) Give four prophylactic measures used in controlling diseases in livestock. (2 marks)
- b) State four mechanical measures of controlling ticks in livestock production. (2 marks)
16. State two functions of caecum in poultry production. (1 mark)

**SECTION B (20 MARKS)****Answer all the questions in this section in the spaces provided.**

17. Below is a diagram illustrating a farm implement, Study it and answer the questions that follow.

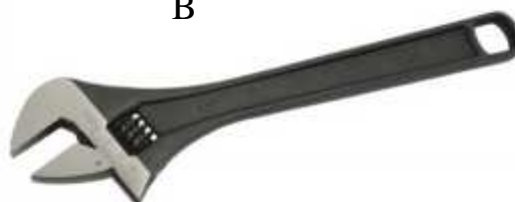


- a) Identify the implement illustrated above. (1 mark)
  - b) State the use of the implement on the farm. (1 mark)
  - c) Explain three maintenance practices carried out on the implement. (3 marks)
18. Below are illustrations of farm tools and equipment.

A



B

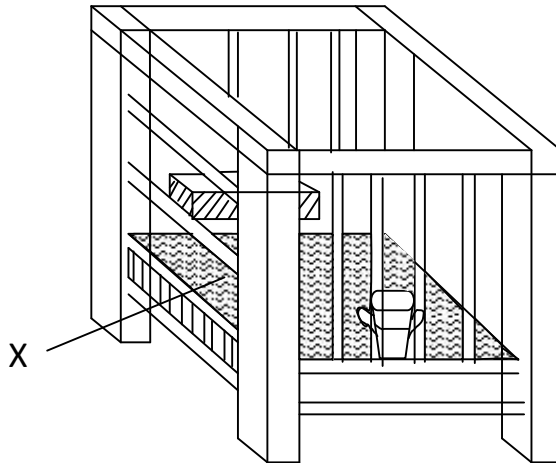


C

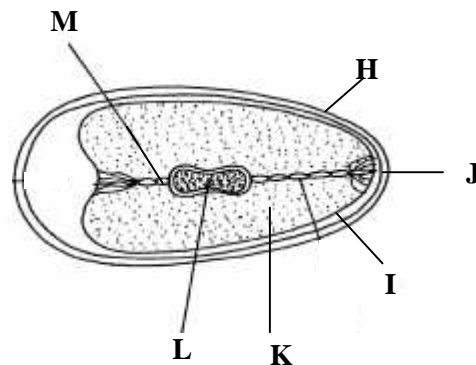




- a) Identify the tool labelled A and C (2marks)  
 b) State the advantage of tool B over tool C (1 mark)  
 c) State two maintenance practices carried out on tool labelled B. (2 marks)
19. Below is a farm structure. Study it carefully and answer the questions that follow.



- a) Identify the farm structure above (1 mark)  
 b) State the requirement of the part labelled X (1 mark)  
 c) State three maintenance practices that should be carried on the structure. (3 marks)
20. The diagram below is an illustration of an egg. Study it carefully and answer the questions that follow.



- a) Name the parts labelled I, J, K and M. (2 Marks)  
 b) Give two qualities of the part labelled H that would be considered when selecting eggs for incubation. (2 Marks)  
 c) What is the function of the part labelled L (1 Mark)

### **SECTION C (40 Marks)**

**Answer any two questions from this section.**

21. a) State five reasons for feeding livestock (5 marks)  
 b) Describe the factors a farmer should consider when selecting a gilt for breeding. (8 marks)  
 c) Outline routine management practices that should be carried out on a lactating ewe. (7 marks)
22. a) Outline routine maintenance practices that should be carried out in deep litter system. (6 marks)  
 b) State eight practices that would ensure clean milk production. (6 marks)  
 c) Compare the use of an ox-drawn mouldboard plough with that of a tractor drawn plough (10 marks)
23. a) Describe the importance of farm mechanization. (6 marks)  
 b) Describe East Coast Fever under the following sub headings  
 a) Causal organism (1 marks)  
 b) Signs of infection (5 marks)  
 c) Control measures (3 marks)
- c) Outline five causes of stress in poultry. (5 marks)

**MACHAKOS COUNTY FORM 4 TRIAL AND PRACTICE EXAM 2015***Kenya Certificate of Secondary Education (K.C.S.E)***AGRICULTURE PAPER 1****443/1****MARKING SCHEME****SECTION A (30 MARKS)**

1. a) Involves sowing small seeded pasture grasses under the established arable crop. (1x1=1mark)
- b) Sowing of one pasture crop in an established or existing pasture e.g. planting desmodium over Rhodes grass. (1x1=1mark)
- c) Process where during decaying proteins from dead animals and plants are broken to ammonia and other substances by putrefying bacteria. (1x1=1mark)
2.
  - Wood should be only 1 year old or less
  - Healthy and well developed visible vegetative buds
  - Be mature and relatively hard shoots preferably from middle portion.
  - Obtained from centre portion  $\frac{2}{3}$  of the shoot base
  - Pathogen free
  - From high yielding mother trees (any 4x $\frac{1}{2}$ =2 mks)
3.
  - Cheaper and more convenient to apply saving on time, cost and labour
  - Balanced in all plant nutrients
  - Easy to store as they do not form lumps when stored for long (any 2x $\frac{1}{2}$ =1mks)
4.
  - Contains more nutrients and organic matter for crop growth
  - Provides good medium for root growth and support
  - Facilitate aeration and good drainage
  - Discourages soil erosion and surface run off. (4x $\frac{1}{2}$ =2 mks)
5.
  - Application of organic matter/manure into the soil
  - Minimum tillage
  - Tilling at the right moisture content
  - Crop rotation
  - Cover cropping
  - Mulching
  - Intercropping
  - Mixed cropping (any 4x $\frac{1}{2}$ =2 mks)
6.
  - Makes the seed come into contacts with the soil moisture
  - Promote uniform germination of the tiny seeds
  - Protect the top soil layer and tiny seeds from being blown away by wind. (any 2x1=2mks)
7.
  - Relates to production of a given quantity of product in a given period of time.
  - When all costs are analysed and converted into monetary value they help to indicate the most profitable level of production.
  - Used to calculate gross margins (4x  $\frac{1}{2}$  =2 mks)
8.
  - Plant population and seed rates
  - Time spent in planting
  - Weed control. (any 2x  $\frac{1}{2}$  = 1mk)
9.
  - Invoice
  - Statement of accounts
  - Bank statements
  - Receipts
  - Delivery note
  - Purchase order. (any 3x  $\frac{1}{2}$  =1  $\frac{1}{2}$  mks)

- 10.
- Such companies engage in monopolistic practices
  - If management is insufficient big losses be may incurred
  - Where ownership is foreign e.g. Delmonte benefits to the country in which estate is situated are limited to employment creation and paying taxes to government.
  - Manner in which they are organized are liable to labour and social problems. (any 4x ½ =2 mks)

- 11.
- Leaf chlorosis
  - Leaf curling
  - Mosaic
  - Malformations
  - Rosetting. (4x ½ =2 mks)

- 12.
- Well sheltered place
  - Security
  - Previous cropping
  - Topography
  - Nearest to the water source
  - Type of the soil.

13. Seed dressing-coating of seeds with fungicides or pesticides to protect them against soil borne diseases and pest. (1x1=2mks)
- Seed inoculation-coating of legume seeds with the right strain of nitrogen fixing bacteria, Rhizobium (1x1=1mk)

- 14.
- Encourage fresh regrowth
  - Improve yield in the next season
  - Reduce incidences of bud diseases. (1x ½ =3 mks)

- 15.
- Proper supervision of land
  - Economic use of time and saving on transportation cost
  - Agricultural advice by extension officer
  - Soil conservation and land improvement
  - Constructions of permanent structures e.g. fencing and building
  - Economic operations of activities
  - Weeds, pest and diseases control is enhanced
  - Sound farm planning and adoption of crop rotation programme. (5x ½ =2½ mks)

**SECTION B (20 MARKS)**

16. i)

| MAKAU'S FARM                     |         |     |                |         |     |
|----------------------------------|---------|-----|----------------|---------|-----|
| Balance sheet                    |         |     |                |         |     |
| As at 30 <sup>th</sup> June 2011 |         |     |                |         |     |
| Liabilities                      | Sh      | Cts | Assets         | Sh      | Cts |
| Current liabilities              |         |     | Current assets |         |     |
| Creditors                        | 49,000  | 00  | Cash at hand   | 15,000  | 00  |
| Equity overdraft                 | 24,000  | 00  | Cash in bank   | 50,000  | 00  |
|                                  |         |     | Debtors        | 18,000  | 00  |
|                                  |         |     | Goats          | 48,000  | 00  |
| Long term liabilities            |         |     | Fixed assets   |         |     |
| Loan: Equity                     |         |     | Oxplough       | 20,000  | 00  |
| Total liabilities                | 180,000 | 00  | Working tools  | 15,000  | 00  |
|                                  | 253,000 | 00  | Land           | 70,000  | 00  |
|                                  |         |     | Networth       | 17,000  | 00  |
| Total                            | 253,000 | 00  |                | 253,000 | 00  |

- ii) Its insolvent, the value of liabilities exceeds assets value, the business can't meet all that it owes other firms. (2x1= 2mks)
17. a) root pruning (1x1=1mk)
- b)
- Tree seedlings develop strong, short and dense roots systems
  - Minimizes damage to seedlings during transplanting
  - Lifting seedlings using transplanting is easier. (3x1=3mks)
- c)
- Agrisilviculture
  - Silvopastoral
  - Agrosilvopastoral (3x<sup>1</sup>/<sub>2</sub>=1 ½ mks)
18. i) American bollworm (1x1=1mk)
- ii) Spraying with insecticides  
Crop rotation (2x1=2 mks)
- iii) Beans  
Tomatoes (1x1=1mk)
19. a) Staking (1x1=1mk)
- b)
- Production of clean fruits
  - Easy to harvest/spray
  - Increase yield as leaves are well exposed for photosynthesis
  - Prevent/protects fruits from rotting due to contact with soil. (4x1=4mks)
- c) Trellising (1x1=1mk)

**SECTION C (40 MARKS)**

20. a)
- Bargaining for better prices of farm produce
  - Ensuring adequate and timely supply of farm produce.
  - Bargaining for reasonable and affordable prices of farm inputs
  - Publishing monthly magazine known as "farmers" voice
  - Offering technical services to farmers.
  - Provision of better infrastructure e.g. roads/electricity/telephone services to facilitate quick delivery of farm produce.
  - Provision of loan facilities
  - Adequate control of crop and livestock pest and diseases.
  - Looking for markets of farmers produce both locally and overseas
  - Representing Kenyan farmers in the international Federation of Agricultural producers. (Any 5x1=5 mks)
- b)
- Size of the farm
  - Environmental factors
  - The current trend in labour market
  - Farmer's objectives and preferences
  - Possible production enterprises
  - Existing market conditions and price trends. (5x1=5mks)
- c)
- Picked manually
  - Grading of seed cotton starts during harvesting.
  - Seed is sorted into two grades AR (safi) and BR (fifi)
  - AR is the first grade free from seed damage and foreign matter/ should be white
  - BR may not have all the required qualities
  - Picker to have two containers one for grade AR and the other for grade BR
  - Care should be taken to ensure no foreign matter such as leaves/ small twigs are mixed with seed cotton.
  - Picking is avoided when cotton is wet due to rain/morning dew.
  - Sisal bags not used because the fibres may mix with cotton causing problems during ginning. (10x1=10mks)

21. i. a)
- Seedbed dug deeply (depth of 20cm)
  - Soil worked to a fine tilth
  - No application of manure for it induces forking
  - Makes rows of drills 30cm apart. (Any 3x1=3mks)
- b)
- Mature at 3-5 months
  - Done depending on the use intended for the crop
  - Harvesting by pulling out the crop
  - Ensure soil is moist during harvesting
  - Alternatively use a plough called carrot lifter to loosen the soil before lifting.
  - Mature carrot tubers are 2½ -3cm thick at top (any 4x1=4 mks)
- ii)
- **Mulching**-smothers weeds
  - **Cover cropping**-smothers weeds
  - **Crop rotation**-when some crops that are associated with a certain weed are rotated weeds do not germinate e.g. striga in cereals and sugarcane farms won't germinate if dicots are grown.
  - **Timely planting**-Allows crops to establish early before introduction to weeds.
  - **Clean seedbed**-This starts crops well and effectively compete with weeds
  - **Flooding**-Mainly in rice fields - discourage non aquatic weeds.
  - **Use of clean seed/planting material**- prevents the introduction of weeds to the farm land.
  - **Proper spacing**-helps to create little space for weed growth and forming a canopy which suppress weeds. (any 5x2=10mks)
- iii)
- Essential for protein synthesis
  - Increase the oil content in oil crops e.g. groundnuts/soya beans.
  - Essentials in the formation of some vitamins e.g. Vitamin B1
  - Essential for the activation and activities of certain enzymes e.g. co-enzyme A
  - Influences nitrogen fixation by legumes.
  - Aids in the formation of cells
  - Essential in chlorophyll formation
  - Essential for carbohydrate metabolism. (any 3x1=3 mks)
22. a)
- **Soil fertility**-materials derived from fertile origins end up in different destination
  - **Creation of lakes**- moulds or blocks of rocks have dammed rivers courses causing temporarily lakes
  - **Damaging property and causing loss of life** e.g. farmland, buildings, homes, lines of communications/transport routes/loss of life.
  - **Soil erosion**-on steep slopes
  - **Permanent scars on landscape**-No support for vegetation and remain unattractive.
  - **Tourist attraction**-e.g. weeping rocks of Kakamega or kit Mikai in Seme, Kisumu County (Any 6x1=6mks)
- b)
- Help to propagate clones that cannot be propagated in any other way
  - Helps to shorten maturing age
  - Possible to grow more than one type of fruit on same plants.
  - Plant with desirable root characteristics e.g. disease resistance, vigorous root system but with undesirable products to produce desirable products.
  - Helps to repair damaged plants (any 4x1=4mks)
- c)
- Training-Formally or informally-formally in colleges/schools. Improved through farmers training centres, field days, agricultural shows, demonstration farms.
  - Farm mechanisation-Incorporating machinery in farm's operation
  - Giving incentives and improving terms and conditions of services
  - Labour supervision-keeping proper and up to date records on the time work commences and ends, type of work and amount done, records of absenteeism, malingering, theft/robbery. Etc.
  - Assigning specific task-governed by labour skills, one clearly knows clearly their duties (any 5x2=10mks)

**MACHAKOS COUNTY FORM 4 TRIAL AND PRACTICE EXAM 2015***Kenya Certificate of Secondary Education (K.C.S.E)***AGRICULTURE PAPER 2**

443/2

**MARKING SCHEME****SECTION A (30 MARKS)**

1.
  - Rhode Island
  - Light Sussex
  - New Hampshire red
  - Black Australops (4x ½ =2mks)
2.
  - Lose vitality
  - Lose weight
  - Have retarded growth
3.
  - Possible to compare animals of different age groups since heifer locations are known
  - Possible to make direct comparison of bulls at different AI centres.
  - It's accurate
  - Eliminates differences brought out by the environment since average performance of herd is used.
4.
  - Facilitate tugging/mating
  - Prevents blowfly infestation
  - Gives good fat distribution throughout the body. (Any 2x ½ =1mk)
5.
  - Speed reduction mechanism
  - Enables one of the wheels to move faster than the other when negotiating corners. (2x ½ =1mk)
6.
  - Retarded growth
  - Lowered productivity
  - Lowered reproductivity due to reduced animal vigour
  - Lowered resistance to diseases or infections. (any 4x ½ =2mks)
7.
  - Poor ventilation
  - Overcrowding
  - Age-young animals
  - Effects of diarrhoea/other illnesses (4x ½ =2mks)
8.
  - Taking the cow into the milking shade
  - Rattling sound of buckets
  - Sight of a milk man/milk woman
  - Sight or smell of food in the feed trough
  - Massaging or washing of the udder with warm water.
  - Suckling by the calf
  - Sight of the calf for cows inclined to suckling calves (any 4x ½ =2mks)
9.
  - Where land is not accessible by tractors
  - Where the land is steep/very steep slopes
  - Small pieces of land
  - Lands that are irregularly shaped
  - Cost of hiring tractors is high
  - Other sources of power unavailable. (any 4x ½ =2mks)
10.
  - During confinement in sick yard/confined grazing units.
  - Stall feeding/watering
  - When transporting animals to markets/agricultural shows/slaughter houses.

- During service of the animal e.g. AI
- During land spraying against external parasites.
- During removal or harvesting of livestock products e.g. honey/milk
- When carrying out routine management operations e.g. deworming/castration/dehorning/h hoof trimming/debeaking/injection of drugs. (any 4x ½ =2mks)

- 11.
- Availability of capital
  - Security
  - Market availability
  - Labour availability
  - Knowledge of the farmer
  - Availability of land for rearing
  - Topography of the land.
  - Availability of appropriate equipment. (any 4x ½ =2mks)

- 12.
- Cost of feedstuff
  - Availability
  - Nutritional composition
  - Physical/processing nature of feedstuff. (4x ½ =2mks)

- 13.
- Cleaning the fish to remove mud/any worms
  - Cleaning abdominal cavity thoroughly
  - Keep fish in open containers
  - Removing scales and slime
  - Opening the fish on the side to remove gut and the intestines/ gutting. (any 4x ½ =2mks)

- 14.
- Take many years to grow and make an effective fence.
  - Cannot be used for paddocking because they occupy a wide space
  - Hedges can be used as hiding places for rodents and thieves.
  - Thorny species cause injuries to livestock
  - Their growth may be irregular thus allowing gaps for animals and thieves to pass through. (any 4x ½ =2mks)

15. a)
- Use of prophylactic drugs
  - Carrying out regular vaccinations
  - Control of vectors
  - Treatment of sick animals. (4x ½ =2mks)

- b)
- Burning the infested pastures
  - Interfering with or altering the ticks environment.
  - Fencing off the pasture land and farm
  - Starving ticks to death
  - Handpicking ticks from livestock and killing them. (any 4x ½ =2mks)

- 16.
- Have microorganisms to digest cellulose
  - Absorb water and the byproducts of microbial digestion. (2x ½ =1mk)

### **SECTION B (20 MARKS)**

17. a) Boom sprayers (1x1=1)
- b) Used for applying pesticides/herbicides/foiar feeds. (1x1=1)
- c)
- Tank of sprayer should be drained before and after use.
  - Tank and all parts should be washed thoroughly with clean water and dried.
  - All parts prone to rusting and painted. (any 1x3=3mks)
18. a) A-Ring spanner

- B-Open ended spanner
- b) Has an adjusting nut which is used to close/open the jaws depending on the size of the nut to be opened or tightened. (1x1=1mk)
- c)
- Apply grease to rotating part
  - Store properly in a tool rack
19. a) Calf pen
- b) Have slatted floor (1x1=1)
- c)
- Should be clean.
  - Leaking roof repaired
  - Walls to be white washed to prevent lead poisoning
  - Keep dry and warm by placing dry litter. (any 3x1=3mks)
20. a)
- I-Inner shell membrane
  - J-Outer shell membrane
  - K-Albumen
  - M-Challazae
- b)
- Smoothness of the shell
  - Cleanliness
  - Oval in shape
  - Absence of cracks on the shell (4x ½ =2mks)
- c) Provide nutrients for the developing chick (1x1=1)

### **SECTION C (40 MARKS)**

21. a)
- Provide energy/ maintenance of body temperature
  - For growth and repair of body tissues
  - For maintenance of good health
  - Production of various products
  - Enhance reproduction. (5x1=5mks)
- b)
- Should be of age/mature 5-7 months old/90-100kg live weight
  - Good mothering ability
  - Able to grow fast
  - Good conformation
  - With no physical defects
  - Healthy
  - Has 12-14 teats
  - Highly prolific
  - Able to withstand heat stress during mating. (any 8x1=8mks)
- c)
- Proper feeding
  - Control of internal parasites
  - Control of external parasites
  - Vaccination
  - Hoof trimming
  - Provision of adequate clean water
  - Treat in case of infection (7x1=7mks)
22. a)
- Repair/replace broken parts
  - Regular cleaning to remove dirt
  - Dust/fumigate/spray to control parasites and diseases
  - Apply old engine oil on timber parts.
  - Ensure good drainage around the house
  - Maintain a footbath at the entrance. (6x1=6mks)
- b)



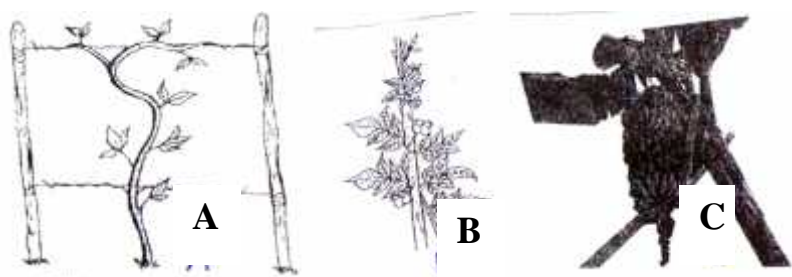
- The milkman should be clean
  - Test for mastitis before milking
  - Milk person should be healthy
  - Ensure utensils/equipment are clean
  - Ensure milking parlour is clean
  - Ensure milking herd is free from zoonotic diseases e.g. TB
  - Cows with mastitis should be milked last
  - Clean the udder
  - Cover the milk
  - Avoid feeds/weeds that would taint milk just before milking.
  - Proper storage of milk/cool dry place. (any 8x1=8mks)
- c)
- Ox-draw plough mould board is lighter hence does not compact the soil as much as the tractor drawn mould board plough.
  - Ox-plough can be used for more farm operations e.g. weeding, ploughing, harvesting root crop than tractor mould board.
  - Ox plough requires less skills to operate compared to the tractor plough.
  - Tractor plough is faster than ox plough hence can plough a large area within a short time.
  - Source of power for ox plough is not as reliable as the source of power for tractor plough.
  - Ox plough relatively shallow compared to tractor drawn plough that plough deeper.
  - Ox plough can be used in steeper slopes where tractor plough cannot plough.
  - Ox plough requires more people to operate than tractor plough.
  - Ox plough is cheaper to buy than tractor plough.
  - Ox plough is cheaper to maintain than tractor plough. (10 x1=10mks)
23. a)
- Makes farm operations timely/faster
  - Economizes on labour
  - Work is done more efficiently
  - Reduces drudgery/can accomplish heavy task
  - Cheaper per unit work done. (6x1=6mks)
- b)
- i) Theirelia parva (1x1=1)
- ii)
- Swollen lymph nodes especially at base of ears, shoulders and stifle joints
  - High temperature/fever
  - Produce a lot of saliva/profuse salivation
  - A lot of tears production/lachrimation
  - Difficulty in breathing
  - Haemorrhages in the vulva and mouth
  - Coughing
  - Sight impairment (any 5x1=5mks)
- iii)
- Ticks controlled through regular dipping, spraying or hand dressing using appropriate acaricides.
  - Fence to keep out strange animals away
  - Treatment using appropriate drugs. (3x1=3mks)
- c)
- Sudden change in routine
  - Diseases and pest infestation.
  - Lack of food and water
  - Strangers and predators in the house.
  - Sudden noise such as that of tractor, plane
  - Poor handling of birds
  - Overcrowding
  - Climate weather change
  - Poor lighting in the house
  - Introduction of new birds
  - Unbalanced diet. (any 5x1=5mks)

**KAMDARA JET 2015****Kenya Certificate of Secondary Education (K.C.S.E)****443/1****AGRICULTURE****PAPER 1****TIME: 2 HOURS****SECTION A (30 MARKS)***Answer all the questions in this section in the spaces provide.*

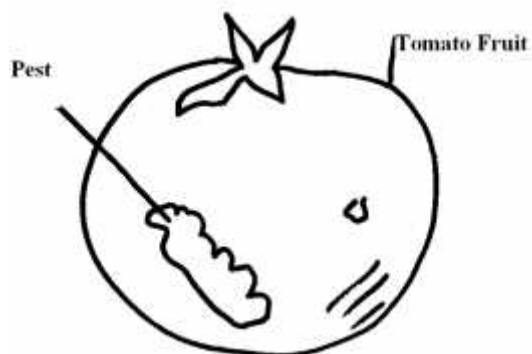
1. Give **two** examples of the following: (3marks)
  - a) Organic manures
  - b) Straight fertilizer
  - c) Incomplete compound fertilizer
2. Name the primary macronutrient responsible for the following in plants. (2marks)
  - i) Protein synthesis
  - ii) Proper root establishment and development
3. a) State **two** types of inventories kept in a farm. (1mark)
- b) Differentiate between the two inventories in 3. a) above. (1mark)
4. State **four** factors that would increase the seed rate of maize. (2marks)
5. Give the role of the following in water treatment process. (1½ marks)
  - a) Alluminium sulphate
  - b) Chlorine
  - c) Sodium bicarbonate
6. Outline **one** importance of the following field practices: (1½ marks)
  - a) Pricking out
  - b) Hardening off
  - c) Gapping
7. State and explain **three** factors that determine the depth of planting. (3marks)
8. What is the meaning of the following terms: (2 marks)
  - a). Arable farming
  - b) Seed rate
  - c) Opportunity cost
  - d) Organic farming
9. Give **four** ways government policy contributes to Agriculture. (2marks)
10. Differentiate between the following terms: (2marks)
  - a) Forage crop and fodder crop
  - b) Oversowing and undersowing
11. State **two** crop production practices that can be carried out to maintain appropriate plant population. (1mark)
12. List **two** practices carried out during hardening off seedlings in tomato production. (1mark)
13. Give **four** reasons why grains should be properly dried before storage. (2marks)
14. Outline **four** merits of concession or company form of land tenure. (2marks)
15. a) State **two** precautions that should be observed in harvesting cotton. (1mark)
- b) List **two** methods of plucking tea. (1mark)
16. State **two** effects of too much air in a silo during silage making. (1mark)
17. Name two sources of water in the farm (1 mark)

**SECTION B (20 MARKS)***Answer all the questions in this section in the spaces provided*

18. Below are illustrations of different forms of a field practice carried out in a farm. Use them to answer the questions that follow.



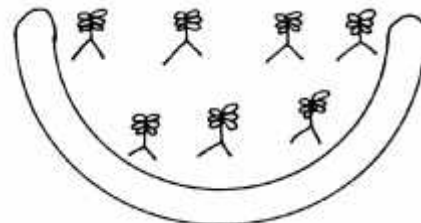
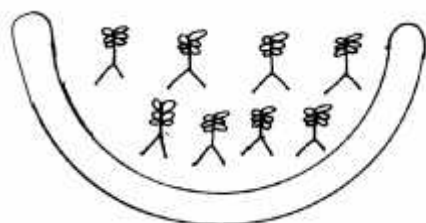
- a) Identify the field practice and name each of the forms labeled A, B and C. (2marks)  
Field Practice
- b). State **three** importance of the above field practice. (3marks)
19. Study the diagram illustrated below and answer the questions that follow.



- a) Identify the pest. (1mark)
- b) Explain how the pest causes damage to the crop. (1mark)
- c) Outline **three** control measures of the pest. (3marks)
20. A farmer has four plots **P1, P2, P3** and **P4** as shown in the table below. Each plot has an agronomic problem as indicated.

| P1                           | P2                    | P3  | P4                    |
|------------------------------|-----------------------|---|-----------------------|
| Infested with bacterial wilt | Deficient in nitrogen | Infested with witch grass ( <i>Striga spp</i> ) | Prone to soil erosion |

- a) A farmer intends to grow maize, Irish potatoes, beans and Rhodes grass. Plan a rotation for the first year of the rotation system. (2marks)  
**P1, P2, P3, P4**
- b). Account for the plan above. (4marks)
21. Study the diagram below



- i) Identify the type of micro catchments illustrated above. (1mark)
- ii) Name one type of crops that you can recommend to be grown under this type of micro – catchments (1mark)
- iii) State **two other** types of micro- catchments that are commonly used on the farms. (1marks)

### **SECTION C (40MKS)**

Answer any two questions from this section on the foolscaps provided.

22. (a) Outline **five** disadvantages of communal land tenure. (5marks)
- (b) Name three forms of agroforestry (3marks)
- (c) Give eight uses of trees in the farm (4marks)
- (d) Describe the procedure of transplanting tree seedlings (8marks)

23. (a) What is a profit and loss account as used in farm accounting (1 mark)
- (b) The information below was gotten from Zipporah's farm. Use it to prepare a profit and loss account for Zipporah's farm for the year ended 31<sup>st</sup> Dec. 2007. (12mks)

| <u>Item</u>         | <u>Kshs.</u> |
|---------------------|--------------|
| Maize seeds         | 10,000       |
| D.A.P Fertilizer    | 25,000       |
| Tractor disc plough | 50,000       |
| Diesel fuel         | 12,000       |
| Milk cans           | 2,500        |
| Knapsack sprayer    | 6,500        |
| Vetinary drugs      | 5,000        |
| Herbicides          | 18,000       |

During the year the following items were sold.

|                  |         |
|------------------|---------|
| Maize to N.C.P.B | 210,000 |
| Milk to K.C.C.   | 500,000 |
| Weaners          | 35,000  |

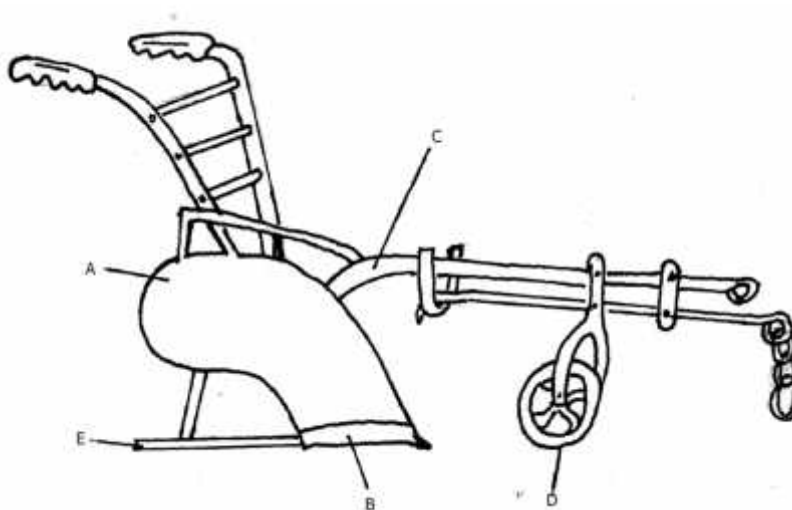
Other vital information from records.

|                                       |         |
|---------------------------------------|---------|
| Opening valuation                     | 300,000 |
| Closing valuation                     | 600,000 |
| Debts receivable for tractor services | 28,000  |
| Interest payable to bank              | 3,000   |
| Depreciation of machinery             | 7,500   |

- (c) Is the farm operating at a profit or loss? (1 mark)
- (d) How much profit or loss did the farm realize? (1 mark)
- (e) Calculate the percentage profit or loss made by the farm (2marks)
- (f) State the meaning of the following financial documents (3marks)
- Invoice
  - Delivery Note
  - Receipt
24. (a) Outline the benefits of timely planting in cereal production. (10marks)
- (b) Explain biotic factors that influence agriculture. (10marks)

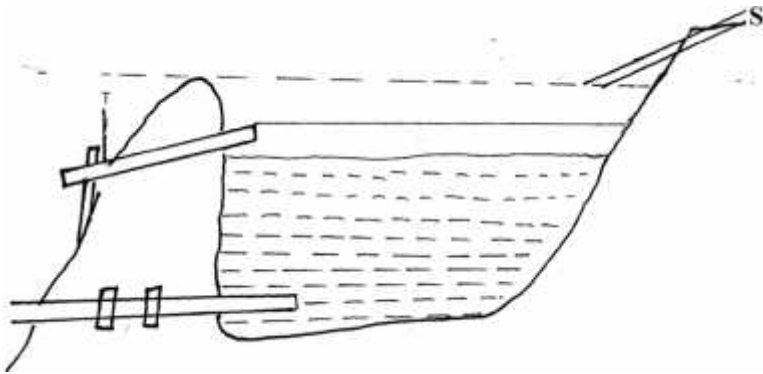
**KAMDARA JET - 2015****Kenya Certificate of Secondary Education (K.C.S.E)****443/2****AGRICULTURE****PAPER 2****JULY / AUGUST 2015****SECTION A (30 MARKS)***Answer ALL questions in this section in the spaces provided.*

1. Outline FOUR reasons for steaming up a gestating cow (2marks)
2. Name a tool recommended for the following practices in the farm (3marks)
  - i) Smoothing rough surface of wood
  - ii) Making threads on metallic pipes
  - iii) Breaking stones during construction and ballast in masonry
3. Name FOUR diseases transmitted by ticks (2marks)
4. Give four problems which may be experienced by a goat and kid during and immediately after kidding (2marks)
5. What are the advantages of using biogas as a source of power in the farm (2marks)
6. State FOUR factors that determine the amount of water on animal drinks (2marks)
7. What is milk let down? (1mark)
8. a) What is an incubator? (1mark)
  - b) Explain how the incubator should be managed for higher hatchability (2marks)
  - c) State the features considered during sorting and grading of eggs (2marks)
9. State the advantages of using wind power in the farm (3marks)
10. State TWO signs of parturition which are shown by an in-calf cow (1mark)
11. State FOUR factors considered when siting a pigsty in a farm (2marks)
12. Below is a diagram of a farm implement

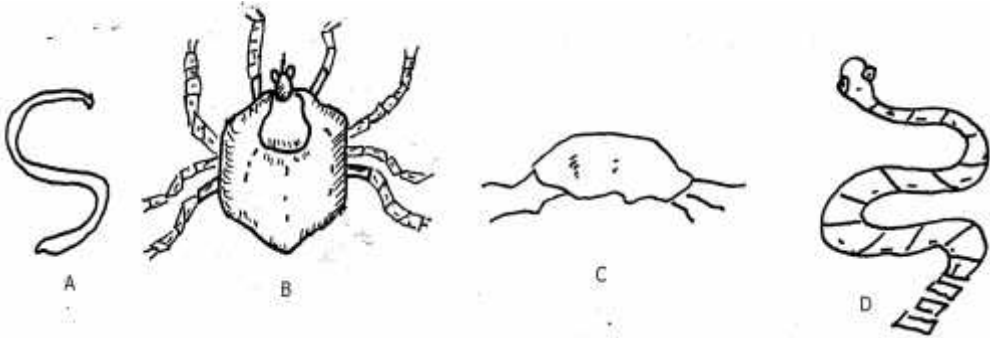


- a) Identify the implement (1mark)
- b) Label the parts marked A, B, C, D and E (2½ marks)
- c) State the functions of the parts labeled C, D and E (1½ marks)

13. Below is a diagram of a cross section of a fishpond

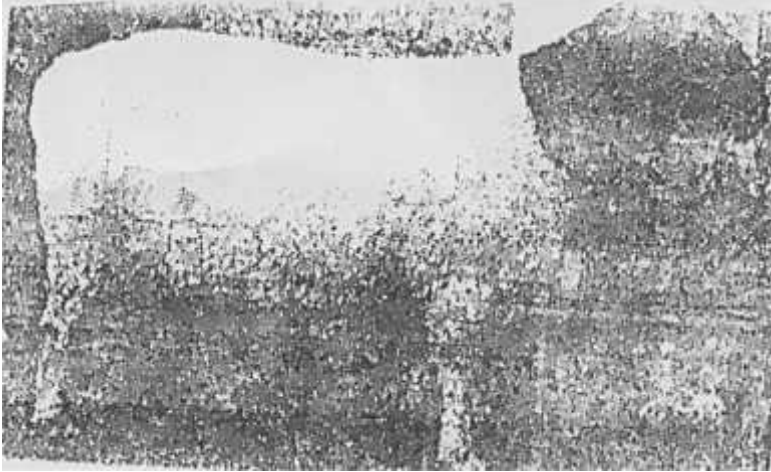


- a) Identify the parts labeled T and S (2marks)
  - b) Why is the pond floor slanted towards one side? (1mark)
  - c) State two maintenance practices carried on the structure illustrated above (2marks)
14. Below are photographs of some livestock parasites. Study them carefully and answer The questions that follow



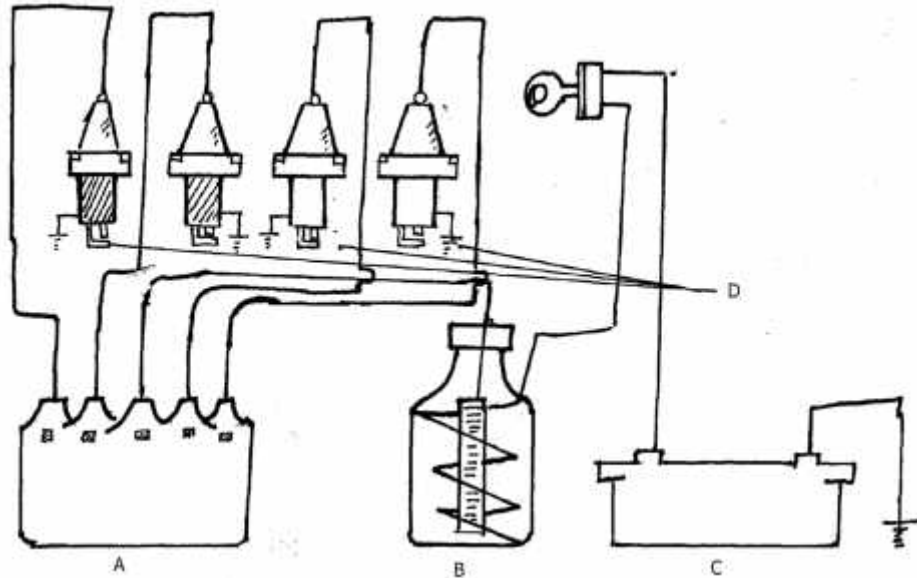
- a) i) Identify the parasites and state where they are found (4marks)
 

|          |                        |
|----------|------------------------|
| Identity | Where found in animals |
|----------|------------------------|
  - ii) State TWO methods of controlling parasites B (1mark)
  - iii) What are the effects of parasites A in animals (1mark)
- b) Below is a photograph of a breed of sheep. Study it carefully and answer the questions that follow



- i) Identify the breed (1mark)
  - ii) The above breed is a cross between two sheep breeds. Name them (1mark)
- c) Using pearsons square method, compute a 100kg ration with 20% DCP from oats which contain 10% DCP and simsim seed cake containing 60% DCP. (show your working) (4marks)

15. Study the diagram below of the ignition system of a petrol engine and answer the questions that follow



- a) Identify the parts labeled A, B, C and D (2marks)  
 b) Give the functions of parts A and B (1mark)

### SECTION C (40 MARKS)

Answer any two questions in this Section in the spaces provided.

16. a) State and explain five factors that influence the siting of farm structures (10marks)  
 b) Outline FIVE advantages of fences in a farm (5marks)  
 c) Outline five methods of reinforcing fences to make them stronger (5marks)
17. a) Explain the management practices that a farmer could carry out to improve milk production in a low yielding dairy cow (10marks)  
 b) Discuss Bee management under the following subheadings;  
 i) Locating of the Bee hive (3marks)  
 ii) Pests and diseases (4marks)  
 iii) Outline FOUR factors that determine the quality of honey (3marks)
18. a) Describe the maintenance practices needed in a tractor battery (7marks)  
 b) Describe the power transmission system under the following units  
 i) Clutch assembly (2marks)  
 ii) Gear box (2marks)  
 iii) Differential (2marks)  
 iv) Final drive (2marks)  
 c) Describe the daily maintenance in servicing of a tractor (5marks)

**KAMDARA JET 2015**  
**MARKING SCHEME**  
**AGRICULTURE PAPER 1-443/1**  
**SECTION A (30 MARKS)**

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1. **Examples of:**
  - a) **Organic manures**
    - Farmyard manure
    - Compost manure
    - Green manure
  - b) **Straight fertilizers**
    - Calcium Ammonium Nitrate (CAN)                      -Sulphate of Potash
    - Single Superphosphate (SSP)                           -Double Superphosphate (DSP)
    - Potassium Chloride/ Muriate of Potash               -Sulphate of Ammonia
    - Urea   -Ammonium Sulphate Nitrate (ASN)
  - c) **Incomplete fertilizer**
    - Diammonium Phosphate (DAP)
    - Nitrophos (20:20:0)
    - Monoammonium Phosphate (MAP)—(11:48:0)
    - 23:23:0
2. **Macronutrient for:**
  - i) **Protein synthesis**----- Nitrogen
  - ii) **Root establishment**---- Phosphorus
3. a). **Types of inventories:**
  - Consumable goods
  - Permanent goodsb) **Difference:**

Consumable goods inventory keeps records of goods which are completely used up in the production process while permanent goods inventory keeps record of goods of durable nature.
4. **Factors that increase seed rate:**
  - Low germination percentage
  - Low seed purity
  - More seeds per hole
  - Close spacing
5. **Role:**
  - a) Aluminiumsulphate -- Coagulation of tiny particles in water
  - b) Chlorine -- Kill disease causing organisms.
  - c) Sodium bicarbonate – Softening of water
6. **Importance of:**

**Pricking out**

  - Avoid unnecessary competition in the nursery
  - Encourages good growth of seedlings.
  - High light intensity to remaining plants

**Hardening off**

Expose seedlings to the actual conditions to be found in the field to minimize shock effects.

**Gapping**

  - Provide efficient ground cover hence control soil erosion
  - Ensure that the appropriate plant population is achieved
  - Efficient ground cover controls weeds
7. **Factors determining depth of planting:**
  - Size of seed
  - Type of germination
  - Soil type
  - Soil moisture content
8. **Meaning of:**
  - a) **Arable farming** – Growing of crops on cultivated land
  - b) **Seed rate** – Quantity of seeds/planting material required per unit area of land



c) **Opportunity cost** – The returns from the best alternative forgone

d) **Organic farming** – The production of crops and livestock without using artificial chemicals.

9. **Four ways government policy contributes to Agriculture:**

- Subsidize the price of inputs to ensure production is affordable.
- Conservation of natural resources to ensure sustainability
- Imposition of high import tax to promote local products
- Stepping up control of diseases to prevent spread and high quality products
- Quality control to ensure effective competition in both local and international market

10. **Differences:**

- Forage crop refers to plants which grow naturally or planted by man for use as livestock while fodder crops are plants established, harvested and fed to livestock.
- Over sowing is the establishment of a pasture legume over an existing pasture grass resulting in a mixed stand pasture while undersowing is the establishment of a pasture under a growing/nurse crop.

11. **Crop production practices:**

- Gapping
- Thinning

12. **Practices during hardening of seedlings:**

- Gradual reduction of watering
- Gradual removal of shade

13. **Reasons for drying of grains:**

- Prevent germination under storage
- Prevent wet heating
- Prevent rotting of grains/occurrence of fungal diseases
- Reduce attack by storage pests

14. **Two merits of concession:**

- Government benefits from taxation
- Employment opportunities are created
- Saving on importation which in turn saves on foreign exchange
- Good management hence efficiency in production

15 a). **Four precautions during harvesting cotton:**

- Should not be done when wet
- Pick weekly for maintenance of quality
- Avoid using sisal bags
- Avoid mixing seed cotton with leaves and twigs
- Dry the picked cotton further before dispatch for maintenance of quality

b). **Two types of plucking tea:**

- Fine plucking/ light plucking
- Coarse plucking/ hard plucking

16. **Effects of too much air in the silo:**

- Excessive aerobic respiration leading to overheating due to excess energy.
- Decomposition of silage material

17. Rain

Surface

Ground

(1/2 x 2 mrks)

**SECTION B (20 MARKS)**

18 a). **Practice: Training**

(2mks)

- A Trellising
- B Staking
- C Propping

b) **Importance of practice:**

(3mks)

- Crop products are not soiled hence are of high quality
- Provide support to plants with weak stems that are subject to over-bearing.
- Facilitate better light penetration
- Field operations like spraying are carried out with ease
- Reduce the incidence of soil-borne pests and diseases
- Enable attainment of high yields

19. a) **Pest** American bollworm  
 b) **Damage:** Bores holes in the tomato fruit causing them to rot  
 c) **Control:**  
 i) Burning crop residue after harvesting  
 ii) Follow a suitable rotational programme  
 iii) Spraying with suitable pesticide
20. a) **Rotation**  
**P1** Maize  
**P2** Beans  
**P3** Irish potatoes  
**P4** Rhodes grass  
 b) **Account:**  
 – **P1** – Soil prone to soil erosion requires a cover crop hence Rhodes grass  
 – **P2** – Soil deficient in nitrogen requires legumes to fix it hence beans  
 – **P3** – Soil infested with bacterial wilt does not require Irish potatoes which are attacked by that disease hence maize grown.  
 – **P4** – Soil infested with witch weed, parasitic to cereals, does not require maize hence Irish potatoes grown there.
21. i) semi-circular bunds (1mrk)  
 ii) Fodder shrubs (1mrk)  
 iii) Trapezoidal bunds  
 Negarim  
 Contour stone bunds  
 Contour rock bunds (1/2 x2 mrks.)

### **SECTION C (40 MARKS)**

22. a) **Five disadvantages** (5mks)  
 – Occurrence of soil erosion  
 – Occurrence of land disputes  
 – Breeding not controlled  
 – Low yields  
 – Difficult in controlling parasites and diseases  
 – Permanent farm plans and investment cannot be made  
 – Farm credit cannot be accessed  
 (b) Intensive hedge row (intercropping)  
 Wide row planting  
 Border planting (3 x 1 = 3)  
 Accept any other correct answer  
 (c)  
 – Source of wood fuel  
 – Source of income  
 – Wind breakers  
 – Leaf litter improve soil fertility  
 – Improve soil structure  
 – Water catchment (attract rainfall)  
 – Labour saving i.e. saves time for fetching firewood  
 – Aesthetic value (8x 1/2)  
 (d)  
 – Holes dug long before transplanting  
 – Transplanting done at onset of rains  
 – Top soil used to refill the hole  
 – Water the nursery bed before transplanting  
 – Seedling placed at the centre of the hole  
 – Polythene paper is removed before transplanting  
 – Soil is firmed around the plant  
 – Water after transplanting  
 – Temporary shade erected above the seedling

23. a) Profit and loss account is a financial statement showing whether the business made a profit or loss during the accounting period. ✓ (1mk)
- b) Profit and loss A/C for Zipporah's farm year ending 31<sup>st</sup> Dec. 2007 ✓ (1mk)

| Expenses & Purchased ½ | Shs       | Cts | Sales & Receipts ✓ | Shs       | Cts      |
|------------------------|-----------|-----|--------------------|-----------|----------|
| Opening valuation      | 300,000   | 00  | Sale of maize      | 210,000   | 00       |
| Maize seeds            | 10,000    | 00  | Milk sales         | 500,000   | 00       |
| D.A.P fertilizer       | 25,000    | 00  | Weavers            | 35,000    | 00       |
| Disc. Plough           | 50,000    | 00  | Debt receivable    | 28,000    | 00       |
| Diesel fuel            | 12,000    | 00  | Closing valuation  | 600,000   | 00       |
| Dairy meal             | 20,000    | 00  |                    |           |          |
| Milk cons              | 2,500     | 00  |                    |           |          |
| Knapsack sprayer       | 6,500     | 00  |                    |           |          |
| Veterinary Payable     | 5,000     | 00  |                    |           |          |
| Herbicides             | 1,800     | 00  |                    |           |          |
| Interest payable       | 3,000     | 00  |                    |           |          |
| Machinery depreciation | 7,500     | 00  |                    |           |          |
|                        | 459,500   | 00✓ |                    |           |          |
| Profit                 | 913,500   | 00✓ |                    |           |          |
| Total                  | 1,373,000 | 00✓ |                    | 1,373,000 | 00✓ ½ mk |

- c) The farm made a profit ✓ (1mk)
- d) The profit was ksh. 913,500/= ✓ (1mk)

$$e) \% \text{ profit} = \left( \frac{\text{Pr ofit}}{\text{Opening valuation}} \times 100 \right) \frac{1}{2}$$

$$= \left( \frac{913,500}{300,00} \times 100 \right) \frac{1}{2}$$

$$= 304.5\% \checkmark 1\text{mk} \quad (2\text{mks})$$

- f) Meaning of:

**Invoice:-** Is a document issued by the seller to the buyer, for the goods and services rendered on credit ✓ (1mk)

**Delivery note:-** Is a document issued by the seller to the buyer, accompanying goods showing the goods delivered, their condition and quantity ✓ (1mk)

**Receipt:-** Is a document issued by the seller to the buyer once cash payment is made and it shows the goods bought, quantity and money paid ✓ (1mk)

24 a). **Benefits of timely planting**

- Benefit from the nitrogen flush
- Maximum use of rain shower/moisture available
- Establishes before weeds build up
- Matures when market prices are high
- Less build up of pests and diseases
- Labour to harvest will be readily available

b)

- Pests – They feed on plant lowering yields and quality.
- Parasites – suck blood from livestock lowering yield. May also transmit diseases.
- Decomposers – cause rotting of animal and plant remains increasing organic matter in soil/increase soil fertility.
- Pathogens – cause diseases, lowering quantity and quality of agro-cultural products.
- Predators – may feed on livestock. Those that feed on pests are beneficial.
- Weeds- compete for nutrients
- Pests – They feed on plant lowering yields and quality.
- Parasites – suck blood from livestock lowering yield. May also transmit diseases.
- Decomposers – cause rotting of animal and plant remains increasing organic matter in soil/increase soil fertility.
- Pathogens – cause diseases, lowering quantity and quality of agro-cultural products.
- Predators – may feed on livestock. Those that feed on pests are beneficial.
- Nitrogen fixing bacteria – change free nitrogen into nitrates

Any 10 explained = 10mks

Any 5 explained = 10mks

**KAMDARA JET AGRIC PAPER 2– 2015**  
**443/2**  
**AGRICULTURE**  
**PAPER 2**  
**MARKING SCHEME**

1.
  - Hastens foetus growth and development
  - It helps in accumulation of the body reservoirs for more milk production in the following lactation period.
  - Assists in the formation of colostrum for the calf
  - Accumulation of body services gives energy to the cow during parturition
  - Provides nutrients for the cow and calf for health and heavy calf at birth
2.
  - i) Wood rasp
  - ii) Stock and die
  - iii) Sledge hammer

(3 x 1 = 3mks)
3.
  - East Coast fever
  - Heart water
  - Red water
  - Nairobi sheep diseases
  - Tick bite fever
  - Sweating diseases
  - Tick paralysis
4.
  - Kids may be too short to reach the teats
  - Kids may be too weak to suckle
  - The placenta may fail to come out
  - There may be complication during the birth process leading to abnormal kids even though is rare (4 x ½ = 2mks)
5.
  - Used for cooking lighting and refrigeration
  - Reduced pollution because the gas burns completely
  - Animal waste is converted to high quality manure
  - The slurry does not smell neither does it attract flies
  - There is reduced deforestation because less trees are cut for fuel. (4 x ½ = 2mks)
6.
  - State of health
  - Climatic condition
  - Level of productivity
  - Breed of animal (4 x ½ = 2mks)
7. Flow of milk from the upper region of the udder to the gland and test cistern (1 x 1 = 1mk)
8. a) Is a specially designed structure that provides conditions necessary for hatching Artificially (1 x 1 = 1mk)
  - b)
    - Provision of optimum temperature 37.70C
    - Provision of correct relative humidity 60%
    - Proper ventilation fo air circulation
    - Candling of eggs to remove unfertilized and those with dead embryo
    - Turning of eggs three times a day 180% (4 x ½ = 2mks)
  - c) Shape
    - Colour
    - Size
    - Internal qualities
    - Cleanliness
    - External qualities (2 x 1 = 2mks)
9.
  - Wind power is cheap
  - Used as a source of other forms of power like electric power
  - It is available in many areas
10.
  - Vulva enlarges

- Udder becomes bigger
- Cow is restless
- Clean discharge comes from the vulva
- Cow lies down frequently
- Pelvic muscles relax
- Cow raises tail (2 x ½ = 1mk)

## 11. Security

Accessibility

Direction of prevailing wind

Future expansion

Soil type

Drainage

Proximity to water source (4 x ½ = 2mks)

## 12. a) Animal drawn plough (1 x 1 = 1mk)

b) A - Mouldboard

C - Beam

E - Landside

B - Share

D - Landwheel (5 x ½ mks)

c) C - Attachments of all parts

D - Adjust depth of ploughing

E - Used for stabilizing the plough against the thrust, caused by the furrow slice by pressing against the fumes wall. (3 x ½ = ½ mks)

**SECTION B ( 30 MARKS)**

## 13. a) T - Spillway / over flow pipe

S - Inlet pipe (1 x 2 = 2mks)

b) To ensure continuous flow of water from upper area to the lower area

Provide a shallow end for feeding the fish

c) Unblock the pipes in case they are blocked.

Seal any cracks

Plant grass along the wall

Replace dry grass on the wall (2 x 1 = 2mks)

## 14. a) i) A - Roundworm - In intestines

B - Tick - on the skin

C - Fleas - on the skin

D - Tape worm - Intestine (4 x 1 = 4mks)

ii) Dipping/ spraying suitable acaricide

Double fencing

Ploughing infested pasture

Hand picking and destroying

Fencing

Rotational grazing

Hand dressing (2 x ½ = 1mk)

iii) Cause malnutrition / emaciation

Block organs eg intestines

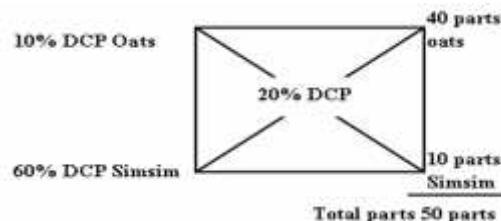
May cause death

Damage the walls of small intestines (2 x ½ = 1mks)

b) i) Dorper (1 x 1 = 1mk)

ii) Dorset Horn and Black Head Persian (1 x 1 = 1mk)

c)



$$\text{Oats} = \frac{40 \text{ parts}}{50 \text{ parts}} \times 100\text{kg} = 80\text{kg each}$$

$$\text{Simsim} = \frac{10}{50} \times 100\text{kg} = 20\text{kg simsim}$$

(½ x 8 = 4mks)

## 15. a) A - Distributor

B - Ignition coil

C - Battery

D - Spark plugs

b) A / Distributor = Causes spark to occur at each cylinder in the required fixing order or sequence. ( $\frac{1}{2} \times 1 = \frac{1}{2}$  mk)

B/ ignition coil = converts the battery voltage from 12 volts to about 6000 volts

Provides a spark at the sparking plugs located in the engine cylinders ( $\frac{1}{2} \times 1 = \frac{1}{2}$  mk)

16. a)

- Security : Located near homestead eg poultry house.
- Accessibility: should be connected with roads for easy of transportaion if inputs and outputs
- Soil type – Should be well drained and unproductive
- Drainage / Gradient: When there is free flow of water
- Nearness to water sources eg. Vegetable nursery for easy irrigation
- Social amenities: Homesteads to be near schools, hospitals and churches
- Other infrastructure such as near roads and power lines
- View of farm (panoramic)
- Future expansion space to be left for future expansion (10 x 1 = 10mks)

b) Advantage of fences

- They mark boundaries
- Keep off intruders / thieves
- Control grazing/ facilitate rotational grazing
- Prevent damage of crops by animals
- Control breeding
- Act as wind breaks
- Control of pests and diseases by preventing entry of wild and sick animals
- Live fences have aesthetic value
- Provide livestock feeds, firewood, mulch and compost manure material
- Add value to farms (5 x 1 = 5mks)

c)

- Cementing the posts
- Inserting droppers between standard posts
- Supporting the corner posts with struts and strainers
- Tightening the wire strainers
- Fixing braces to support the fencing posts (5 x 1 = 5mks)

17. a)

i) Selection should be based on good health, high fertility good body conformation, call poor animals, selection and culling should be continuous exercise

ii) Breeding

- Use superior bulls/ semen from superior bulls
- Breed heifers when fully mature considering weight
- Breed cows 60-90 days after calving to maintain a calving interval of 1 calf per year.

iii) Disease/parasite control

- Keep animals healthy by availing vaccination
- Control external parasites by spraying using appropriate drugs eg. Acaricides
- Control internal parasites using appropriate drugs autihelminth drugs
- Treat sick animals
- Isolate sick animals suffering from contagious or new animals isolated and put under quarantines.
- Avoid physical injuries, to the animals by avoiding sharp objects, holes, use plain fencing wire.

iv) Feeding

- Feed cattle on balance ration; Give adequate feed; feed should be clean/ free from contamination
- Provide minerals and vitamin, salt lick/ maclick block

v) Housing

Provide proper housing/ ventilation; avoid over crowding

vi) General management practices

- Milk at regular intervals; handle animals properly; observe closely heat signs, signs of diseases; keep proper and good records; evaluate the herd. (10 x 1 = 10mks)

b) i)

- Away from the homestead pastures and roads
- Quiet place
- Sheltered place i.e no direct sunshine

- Near flowering plants
- Near a water source
- Area with no bad odours (smell) (1 x 3 = 3mks)
- ii) Pests
  - Ants
  - Bee louse
  - Wax moth
  - Honey badgers (2 x 1 = 2mks)
- Diseases
  - Acarive disease
  - American foulbrood disease (2 x 1 = 2mks)
- iii)
  - Type of plant from which the nectar was obtained
  - Maturity stage of honey at the time of harvesting
  - Method of harvesting
  - Method of processing
  - Presence of impurities
- 18. a)
  - Level of electrolyte should be checked daily
  - Battery terminals should be cleaned to remove corroded materials using a wire brush
  - Terminals should be connected correctly to the tractor
  - Ensure specific gravity(SG) if the electrolyte is between 1.2 – 1.25 if low add sulphuric acid.
  - Place battery on a piece of wood if not in use for a long time
  - The battery should be changed all the time
  - The electrolyte should not get into contact with the electrodes as this will cause corrosion (7 x 1 = 7mks)
- b) i) Clutch Assembly
  - Connects or disconnects the driveshaft to and from the engine
  - Facilitate smooth and gradual take off
  - Provides power from the engine to the power take off shaft (PTO) (2 x 1 = 2mks)
- ii) Gear box
  - Used for selecting any forward or reverse gear to suit the speed
  - Adjust speed in drive from engine crank shaft to drive shaft
  - Altering the distance travelled on the ground in a given time.
  - Transmits power from engine to be applied appropriately
  - Enables vehicle to stop without necessarily stopping the running of the engine (2 x 1 = 2mks)
- iii) Differential
  - Used for changing the direction of the drive to drive to right angles so that power is transmitted to the wheels for forward movement
  - Moderates or adjusts the motion speed as opposed to engine speed
  - Enables each of the rear wheels to rotate independently
- iv) Final drive (wheels and tyres)
  - Used to move the vehicle forward or backwards
  - Enables soft contact with the ground
  - It provides absorption of shock since the wheels are inflated with air
  - Provides traction for better grip on the ground surface. (2 x 1 = 2mks)
- c)
  - Use a dipstick to check on engine oil, level and add appropriately
  - Check the level of fuel on the fuel gauge
  - Check on nuts and bolts and tighten accordingly
  - Grease the nipples using a greasing gun
  - Check the water level in a battery and add appropriately
  - Check on the type pressured using a pressure gauge and adjust accordingly
  - Dirty oil should be removed in the oil type while in the day type compressed air is used to blow the dust.
  - Check the radiator and add clean water
  - Check the belt tension and correct if necessary
  - Sediment bow (and remove large sediment) (5 x 1 = 5mks)

**MOKASA JOINT EVALUATION****Kenya Certificate of Secondary Education (K.C.S.E)****443/1****AGRICULTURE****PAPER 1****SECTION A: (30 MKS)**

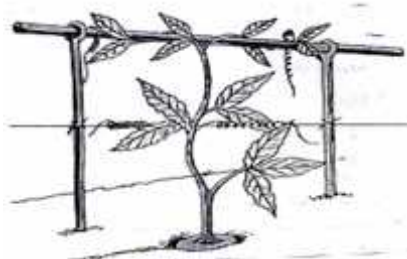
Answer all the questions provided.

1. State four limitations of pastoral farming. (2 mks)
2. Give four benefits of timely planting of crops. (2mks)
3. State 4 factors of soil which influence productivity of crops. (2 mks)
4. Give 4 conditions of land that would make it necessary to carry out reclamation practices (2 mks)
5. State 2 factors that influence the quantity of water used in the farm (1 mk)
6. State 4 reasons for keeping health records. (2 mks)
7. Give 2 types of inventory records. (1 mk)
8. Name 2 situations in which opportunity cost does not exist (1 mk)
9. State 3 ways in which flooded water is important in the growing of paddy rice (1 ½ mks)
10. State 4 ways of maintaining a healthy and high yield grass pasture after planting (2 mks)
11. Give three factors considered while determining the size of a silo (1½mks)
12. Give two ways in which overheating can be avoided during silage making (1 mk)
13. State 4 factors that will determine the depth of ploughing a maize field using tractor drawn implements (2 mks)
14. Give 4 ways in which cover crops help in soil and water conservation (2 mks)
15. List 5 biotic factors that affect livestock negatively (2½mks)
16. State 3 characteristics of soil that are influenced by its texture (1½mks)
17. Distinguish between contact and systemic herbicide (2 mks)
18. Give two reasons why phosphatic are applied at planting time (1 mk)

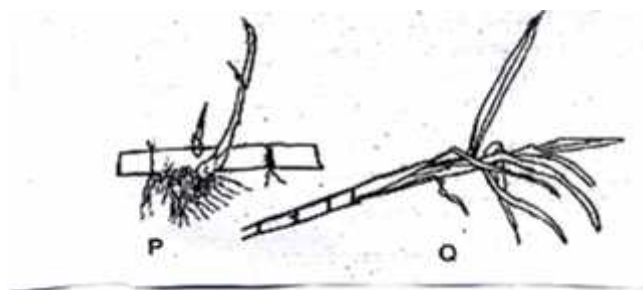
**SECTION B: (20 MARKS)**

Answer all the questions

19. The diagram below shows a practice in crop production



- a) i) Give the identity of the field management practice illustrated above (½mks)
  - ii) Give 2 reasons for carrying out the above field management practice (2 mks)
  - b) A plot measuring 4m x 3m was prepared for planting cabbages at a spacing of 60 cm x 60 cm. Calculate the plant population in the plot (1½mks)  
show your working
20. a) Identify the illustration P and Q which are materials used in propagation of sugarcane



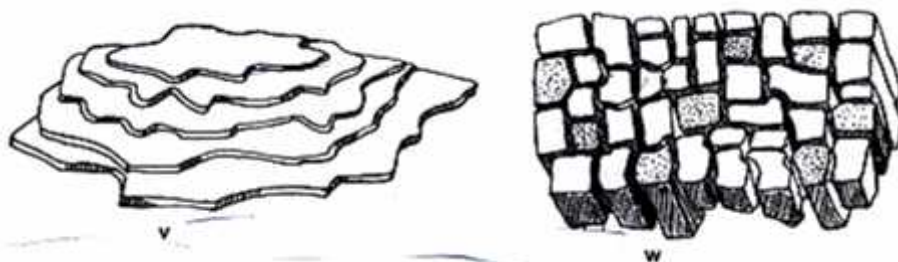
- b) Giving reasons which of the above is more suitable as a planting material in sugar cane? (2 marks)
- c) How is planting material in sugarcane treated to control ratoon stunted disease (1 mark)



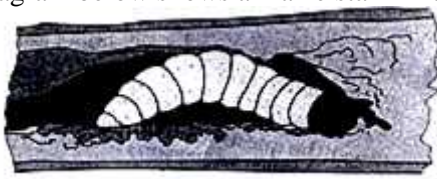
21. The diagrams below labeled H and J are illustrated of coffee plants establishing using two different pruning systems. Examine them closely and answer the questions that follow.



- Name the pruning systems illustrated by diagrams H and J (1 mark)
  - Give two advantages of pruning system illustrated by diagram H over that one illustrated by diagram J (2 marks)
  - Name two types of pruning that should be carried out after the coffee bush has been established using the system J (2 marks)
22. The diagrams V and W illustrate some soil structures. Study the diagrams and answer the questions that follow



- Identify two structures labeled V and W (1 mark)
  - Name the types of soils from which structures labeled V and W can be found (1 mark)
  - State two ways through which structure V may influence crop production (2 marks)
23. The diagram below shows a maize stalk infested by a certain pest. Study it and answer the questions that follow.



- Identify the pest (½ mark)
- Give two types of damages caused to crops by the above pest (2 marks)
- Other than maize name one other crop attacked by pest (½ mark)

### **SECTION C : ( 40 MARKS )**

*Answer any TWO questions from this section in the spaces provided.*

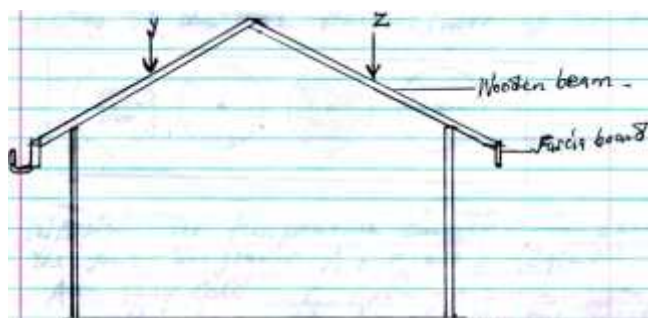
- Describe the field production of tomatoes under the following subheadings
    - Field management practices (7 marks)
    - Grading of tomato fruits (3 marks)
  - Explain five factors considered when designing a crop rotation programme (10 marks)
- Explain ten factors that influence soil erosion (10 marks)
  - Describe six benefits of land consolidation (6 marks)
  - Explain four main objectives of establishing the early African settlement schemes (4 marks)
- Explain the difference between stocking rate and carrying capacity (2 marks)
    - Discuss the advantages of rotational grazing system (5 marks)
    - Describe the precautions when harvesting coffee (3 marks)
  - Explain harmful effects of weeds in the main field (5 marks)
    - Discuss the cultural methods of controlling crop diseases (5 marks)

**MOKASA JOINT EVALUATION****Kenya Certificate of Secondary Education (K.C.S.E)****443/2****AGRICULTURE****PAPER 2****SECTION A [30 MARKS]***Answer all the questions in this section in the spaces provided .*

1. Name a breed of goats that has long hair . [0.5mks.]
2. Give three factors that should be considered when sitting a bee-hive in the farm [1.5marks]
3. State four management practices that would ensure maximum harvest of fish in a fish pond [2marks]
4. Give two reasons why walls of dairy sheds should be white –washed instead of painted with water or oil paint. [1mark]
5. What is the intermediate host for liver fluke. [0.5mks.]
6. What is the duration of estrus cycle in a cow? [0.5mks.]
7. If a dairy cow was noticed to be showing first signs of heat at 6.00am.What time should she be inseminated? [1mark]
8. Give four factors that determine the amount of water required by an animal. [2marks]
9. Name three holding tools and equipment . [1.5marks]
10. Give three functions of a combination squire . [1.5marks]
11. State three functions of the differential in a tractors power transmission. [1.5mks]
12. State three factors that contribute to a high working efficiency of a disc harrow. [1.5marks]
13. List three products obtained from dromedary camel. [1.5marks]
14. If the records showed that a rabbit doe was served on 27<sup>th</sup> September2014 what date did she give birth/kindle? [0.5marks]
15. Give two signs that would show that a rabbit doe is about to parturate . [1mk.]
16. Under what conditions would it be necessary to use a file to smoothen a piece of wood instead of using a smoothing plane? [0.5marks]
17. What is the use of a plumb-bob ? [0.5marks]
18. State four characteristics of a corriedale sheep breed. [2marks]
19. State any two disadvantages that may arise from inbreeding in livestock production. [1mark]
20. Name four cattle diseases caused by bacteria. [2marks]
21. Name any two methods recommended for identifying goats. [1mark]
22. State three field conditions under which a disc plough should be used instead of a mould board plough. [1.5marks]
23. Give three symptoms of milk fever in dairy cattle. [1.5marks]
24. Give four reasons for steaming –up dairy animals. [2marks]

**SECTION B [20MARKS]***Answer all questions in this section in the spaces provided .*

25. The drawing below shows the cross-section of a house under construction. Study it carefully and answer questions that follow .
25. The drawing below shows the cross-section of a house under construction. Study it carefully and answer questions that follow .

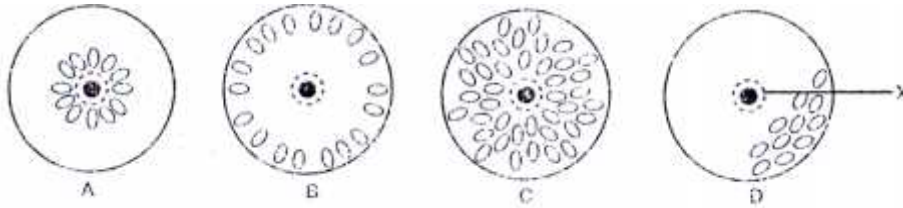


- [a] Assuming that the wooden beams are strong enough to hold the roof load .What is the most likely thing to happen when the roof load exerted presses at point Y and Z . [1mark]
- [b] On the diagram provided draw and label two constructional features you would add to this structure in order to make it more efficient. [2marks]

[c] State two importance of the fascia board in the farm building.

[2marks]

26. The following illustration show the behavior of chicks at different temperatures of the brooder.



[a] Explain the temperature conditions in each of the four diagrams A ,B ,C ,and D.

[2marks]

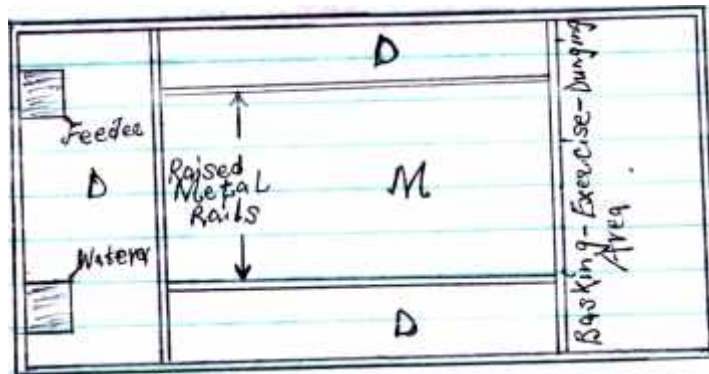
[b] Give one method of assessing temperature in the brooder.

[1mark]

[c] Name two other behavioral observations on chicks when temperature is very high in the brooder.

[2marks]

27. The illustration below shows a pig farrowing pen .Study it and answer questions that follow.



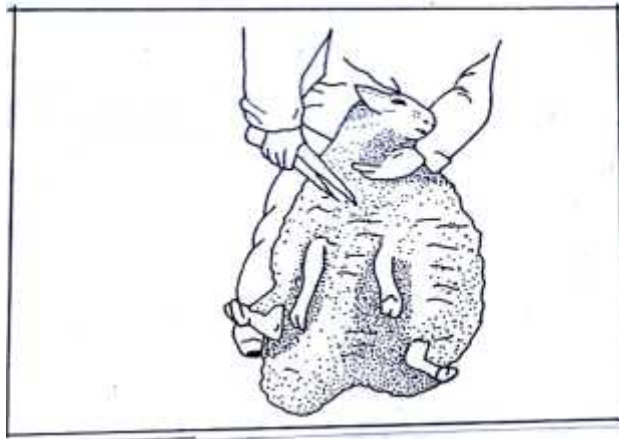
[a] What is the use of the raised metal rails.

[1mark]

[b] Give two uses for the parts labeled D

[2marks]

28. Below is an illustration representing a practice carried out in sheep. Study it and answer questions that follow.



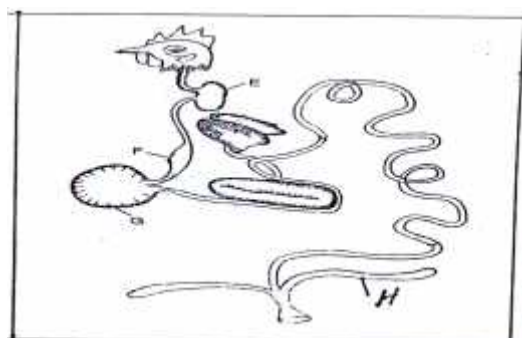
[a] Identify the practice illustrated above.

[1mark]

[b] State three precautions taken when carrying out the above practice.

[3marks]

29. Study the illustration below of a poultry digestive system and answer questions that follow.



- [a] Give two functions of part E.[2marks]  
[b] State one function of part H.[1mark]

**SECTION C [40MARKS]**

*Answer any two questions from this section in the spaces provided after each question.*

30. [a] Describe ten factors that are considered during the selection of a breeding stock. [10marks]  
[b] Describe five effects of parasites on livestock. [5marks]  
[c] Describe the mechanical control measures of ticks. [5marks]
31. [a] Outline five reasons why bees swarm away. [5marks]  
[b] Discuss the preparations and practices that should be carried out on a pregnant sow 10 days before she farrows. [5marks]  
[c] Describe Gumboro disease under the following sub headings.  
Causal organism [1mark]  
Livestock attacked [1mark]  
Symptoms of the disease [6marks]  
Control measures [2marks]
32. [a] Explain five advantages of animal draught power. [5marks]  
[b] Discuss the importance of lubrication system in a tractor. [4marks]  
[c] Explain six factors considered when selecting construction materials for farm structures . [6marks]  
[d] Give five qualities of a good calf pen. [5marks]

**443/1**  
**MOKASA JOINT EVALUATION TEST – 2015**  
**AGRICULTURE PAPER 1**  
**THEORY**  
**MARKING SCHEME**

1.
  - Drought and aridity
  - Diseases and parasites
  - Attack by wild animals
  - Soil erosion due to overstocking
  - Poor pasture species
  - Inadequate land due to overpopulation (4x½=2)
2.
  - Crops make maximum of rainfall
  - Crop seeds germinate faster since the soil is warm.
  - Crops are able to escape the attack by pests and diseases.
  - Crops benefit from available nitrogen flush
  - It enables early supply of crops to the market when they can fetch high prices
  - Crops outgrow and smother weeds
  - It reduces competition for available labour/machinery during peak production periods. (4x½=2)
3.
  - Good supply of plant nutrients and oxygen
  - Good depth
  - Good drainage
  - Abundance of useful soil micro-organisms
  - Adequate water retention
  - Free from pests and diseases. (4x½=2)
4.
  - Very steep land
  - Water logged/marshy land
  - Forestall/bushy area
  - Aridity
  - Tse-tse infected land (4x½=2)
5.
  - Size of the farm
  - Type of the enterprises in the farm
  - Source of the water
  - Method of conveying the water. (2x½=1)
6.
  - Show the health condition of the animals
  - Used in selection/culling of animals
  - Help trace history of diseases for good treatment
  - Show when to carry out routine practices such as vaccination, deworming
  - Show costs of controlling and treating diseases and parasites. (4x½=2)
7.
  - Consumable goods inventory record
  - Permanent goods inventory record (2x½=1)
8.
  - Where there are no choices
  - Where resources are free/unlimited (2x½=1)
9.
  - Promotes growth
  - Controls soil farm pests
  - Controls non-aquatic weeds
  - Avails the right relative humidity for pollution (3x½=1½)

- 10.
- Topdressing with nitrogenous fertilisers/organic matter
  - Practising controlled grazing to avoid denudation
  - Topping to remove unpalatable stems and promote growth
  - Controlling pests mainly moles, termites, colust
  - Irrigating where possible
  - Controlling weeds (4x½=2)
- 11.
- Quantity of forage available for ensiling
  - Number of animals to cater for
  - Length of the dry period to feed forage
  - Bulkiners of the forage. (3x½=2)
- 12.
- Increasing compaction to decrease aerobic fermentation
  - Wilting materials before ensiling
  - Avoid rapid filling of the silo
  - Sprinkling some water (2x½=2)
- 13.
- The type of soil
  - Presence of deep rooted weeds/rhizomatoes weeds
  - Soil moisture content
  - Conditions of implement available (4x½=2)
- 14.
- Reduces the speed of run-off hence lowering the erosive power
  - Reduces speed of raindrop in preventing movement of soil
  - Organic matter from leaves bind the soil particles together
  - Roots of cover crops bind the soil together hence protecting from being carried by water. (4x½=2)
- 15.
- Parasites
  - Pathogens
  - Predators
  - Pests
  - Weeds (5x½=2½)
- 16.
- Aeration
  - Drainage
  - Capillarity
  - Water retention capacity (3x½=1½)
- 17.
- Contact herbicide kill the part of the plant with which they come into contact with whereas systemic herbicide are absorbed by any other part of the plant and trans-located to all parts of the plant, therefore killing the whole plant. 2 marks (mark as a whole)
- 18.
- Encourage early formation and development of roots
  - They dissolve slowly/are less reached hence stay longer in the soil (2x½=1)
- SECTION B**
19. a) i) Trellising (½ mark)
- ii)
- Facilitate easy carrying out of routine practices e.g. spraying
  - Prevent soiling of fruits/clean fruits harvest
  - Control fruits from being infected by soil borne pests
  - Plant is well aerated (2x1=2)
- b) 
$$\frac{\text{Plant population}}{\text{spacing}} = \frac{4\text{m} \times 100}{60\text{cm} \times 60\text{cm}} \times \frac{3\text{m} \times 100}{=33 \pm 1}$$
 (1½marks)
20. a) P – Sugar care sett/cutting (½ mark)  
Q – Green top sugar cane (½ mark)
- b) P – produce roots easily as Q (1 mark)  
may rot easily before root production

- c) Dipping in hot water at 50°C for 2-3 hours/52°C for 1½ - 2 hours (1 mark)
21. a) H – single stem pruning (½ mark)  
J – multiple stem pruning (½ mark)
- b)
- Allow easy picking/spraying
  - No breakages of the stem/branches
  - Provide good ground cover 2x1 = 2 marks
- c) i) Annual pruning  
ii) Removal of secondaries, tertiaries and laterals which have produce two crops (2x1 = 2 marks)  
iii) Changing of cycle after 4-8 years
22. a) V – platy structure (½ mark)  
W – Blocky structure (½ mark)
- b) V- top horizon of forest soil/clayed soils (½ mark)  
W – clay soils (½ mark)
- c)
- Poor soil aeration
  - Poor drainage leading to water logging
  - Poor root penetration/root tuber expansion (2 x 1 = 2 marks)
23. a) Stalk borer (*Busseola fusca*) (½ mark)
- b)
- Make holes on maize leaves causing windowing effect
  - Bores through maize cobs/stems
  - Lower the quality/quantity of maize grains
  - Damage the central shoot of the plant (2x1 = 2 marks)
- c) Sorghum/sugarcane (½ mark)
24. Describe the field production of tomatoes under the following subheadings
- a) Field management practices (7 marks)
- b) Grading (3 marks)
- a) Field management practices
- (i) Timely gapping
  - (ii) Water regularly
  - (iii) Top-dress with nitrogenous fertilizers
  - (iv) Weed early and regularly
  - (v) Stake tall varieties
  - (vi) Prune to remove excess suckers
  - (vii) Control pests such as American bullworm using appropriate method
  - (viii) Control diseases like tomato blight by spraying appropriate chemical (7x1 = 7 marks)
- b) Grading
- Based on;
- (i) Degree of ripeness
  - (ii) Level of size
  - (iii) Disease/pest attack
  - (iv) Variety (3x1 = 3 marks)
- c) Explain five factors considered when designing a crop rotation programme (10 marks)
- (i) Crop nutrient requirements; Gross feeders should come first in the rotation programme.
  - (ii) Root depth of crops; Deep rooted crops should be alternated with shallow rooted crops.
  - (iii) Variety: Crops that belong to the same family should not follow each other in a rotation programme as they are attacked by same pests and diseases.
  - (iv) Weeding: Crops that are difficult to weed should be alternated with those that are easy to weed.
  - (v) Soil fertility: Legumes should be included to help fix nitrogen
  - (vi) Soil structure: Fallow or grass lays should be included in the programme as their roots and other decomposed organic matter bind the soil particles. 2x5 = 10 mark

**SECTION C: (20 marks)**

25. a) Explain ten factors that influence soil erosion (10 marks)
- The amount and intensity of rainfall; when the amount and intensity is high the top soil gets saturated with water and erosion occurs taking soil to rivers.
  - The slope of land; The steepness of the slope increases the speed of runoff and erosion.
  - Soil type; Sandy soil is saturated easily and eroded quickly than clay soil.
  - Soil depth; Shallow soils easily get saturated and eroded
  - Vegetation cover; Vegetation on the soil and plants canopy prevent exposure of soil to erosion.

- Overstocking; uncontrolled grazing of large numbers of livestock overgraze leaving the ground bare for erosion.
  - Deforestation; indiscriminate removal of trees exposes the ground to heavy rainfall and erosion.
  - Indiscriminate burning of vegetation before cultivation; Exposes the soil to wind and rain erosion.
  - Clean weeding; Exposes unprotected soil to agents of soil erosion
  - Ploughing up and down the slope; exposes loose soil to erosion.
- Stating ½ mark x 10 = 5 marks  
Explanation ½ mark x 10 = 5 marks (10 marks)
- b) Describe six benefits of land consolidation (6 marks)
- Enables proper supervision of land
  - Enables economic use of time, saving transportation costs.
  - Government extension service is made available
  - Proper farm planning and crop rotation programmes can be initiated.
  - Soil conservation and land improvement using farm mechanization can be initiated
  - Construction of permanent farm structures is possible
  - Farm operations have the benefit of economics of scale
  - The farm title deed can be used to acquire loans
  - Control of weeds, pests and diseases becomes easier (6x1 = 6 marks)
- c) Explain four main objectives of establishing the early African settlement schemes (4 marks)
- Ease the population pressure within the African reserved areas.
  - To increase the Agricultural production by making use of idle land uninhabited
  - To create employment by producing enough agricultural products for use and excess for sale.
  - To control tsetse flies in tsetse inhabited areas like Lambwe (Valley in South Nyanza) (4x1 = 4 marks)
26. a) i) Stocking rate refers to the number of animals maintained per unit of land while carrying capacity is the ability of the forage stand to maintain a particular number of livestock units per unit area. (2 marks as a whole)
- ii) Advantages of rotational grazing
- Livestock make maximum use of pasture
  - Reduces build-up of pests and diseases
  - Animal waste is distributed evenly in all fields
  - Pasture is given time to regrow before it is grazed again.
  - Excess pasture can be harvested and conserved/sold
  - Possible to apply fertilizers in plants of the pasture which are not in use.
  - Reseeding and weeding can be done (5x1 = 5 marks)
- iii) Precautions when harvesting of coffee
- Pick the red berries (cherries) only
  - Sort out the berries to remove unripe/diseased/over-ripe
  - Deliver the berries to the factory the same day they are harvested. (3x1 = 3 marks)
- b) i) Harmful effects of weeds
- Complete with crops for nutrients/space/light/soil moisture reducing yield.
  - Some are parasitic crops leading to stunted growth
  - Some weeds are allelopathic e.g. couch grass exudate toxic substance which suppress the growth of maize crops.
  - Some weeds reduces the efficiency of the workers in a maize field.
  - Some weeds harbour insect pests and other diseases which spread to the growing maize crop. (5x1=5 marks)
- ii) Cultural method of controlling crop diseases.
- Use of healthy planting materials
  - Field hygiene/rogueing/use of clean implements
  - Proper seedbed preparation
  - Proper spacing to control spread of diseases in certain crops such as rosette in groundnuts
  - Heat treatment e.g. to control ratoon stunting disease in sugarcane
  - Proper drying of cereals and pulses to minimise storage of pests
  - Use of resistant varieties
  - Proper plant nutrition to avoid nutrient deficiency diseases
  - Planting certified seeds
  - Pruning to create unfavourable microclimate
  - Closed season – to break the life cycle of pathogens
  - Crop rotation – break the life cycle of pest
  - Controlling of vectors – helps stop the spread of diseases. (5x1 = 5 marks)



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**MOKASA JOINT EVALUATION TEST – 2015****AGRICULTURE PAPER 2****THEORY****MARKING SCHEME****SECTION A[30MARKS]**

1. Angola goat [0.5mks.]
  2.
    - Nearness to nectar producing flowers.
    - Shady/cool place/bushy.-Accessible to water.
    - Safe distance from livestock/homestead/road.
    - Away from disturbances and noise.-Protected from predators. [1.5mks]
  3.
    - Control stocking rate.-Control water pollution.-Supply food.-Control predators.
    - Aeration of water by flowing.-Appropriate depth.-Right maturity harvest. [2mks.]
  4. Avoid poisoning by chemicals;-Discourage insect pests;-Avoid tainting milk. [1mk.]
  5. Fresh water snail/Mud snail. [0.5mk]
  6. 18-22days [0.5mk.]
  7. Any time between 6.00 pm and midnight. [1mk.]
  8.
    - More water when the temperature is high;-Dry food demands more water;
    - Heavy producers and draught animals demand more ;-Body size;-Species of the animal. [2mks.]
  9. Sash clamp ;-G clamp ;-Quick action vice ;-Table clamp . [1.5mks.]
  10.
    - Check length of work ;-Check angle of work ;-Check level of work ;
    - Check square of work; [1.5mks.]
  11. Manouvre a corner without skidding;-Transform circular motion of propeller shaft to traction of the hub ;-Enables wheels to last long. [1.5mks.]
  12. Serrated discs ;-Off-setting the gangs ;-Deep penetration ;-Harrowing when the soil has appropriate moisture ; [1.5mks]
  13. Meat;-Milk;-Hide; [1.5mks.]
  14. 25<sup>th</sup>-29<sup>th</sup> October2014 [0.5mks.]
  15. Starts to build a nest using her fur;-Goes off food; [1mk.]
  16. Piece of wood is very small;-Surface required not very smooth; [0.5mks.]
  17. Checking perpendicularity of a building wall; [0.5mks.]
  18. Fleece wholly covers the body;-Open white face/does not suffer from blindness;-Hornless/docile/hardy;-Lambing % of100-125;-Fleece heavy and of good length; [2mks.]
  19. Loss of hybrid vigor;-Decline in fertility;-Reduced performance;-Pre-natal mortality; [1mk.]
  20. Anthrax;-Black quarter;-Scours; Contagious abortion;-Mastitis;-Calf pneumonia. [2mks.]
  21. Ear notching;-Tattooing;-Ear tagging; [1mk.]
  22. Field with obstacles;-Field with hard pans;-Field with sticky soil;-Very dry soil; [1.5mks.]
  23. Dullness;-Muscular twitching;-Staggering;-Animal falls and is unconscious;-Animal lies with the body stiffening;-Body functions fail;-Loss of appetite;-Stomach contents drawn to the mouth causing lung fever;[1.5mks.]
  24.
    - Provide nutrients for foetal growth;-Energy for parturition;-Healthy offspring;
    - Healthy dam;-High milk yield afterbirth; [2mks.]
- SECTION B[20MKS.]**
25. [a] The span of the building expands at the top out wards; [1mk.]
  - [b] Tie beam/cross tie;-Rafters batten;-Struts; [2mks.]
  - [c] Protects the rafter from attack by pests/disease/weather;-Attachment of gutters;-Add beauty to the structure; [2mks]
  26. [a] A—very cold ;-B—very hot;-C—optimum temperature;-D—draught from one direction;[2mks.]
  - [b] Use a thermometer;[1mk.] [c]-Spreads wings;-Pants/wide open beaks;Lie on their abdomen flat;-Make a lot of noise;-Drink a lot of water; [2mks]
  27. [a] Protect the sow from lying/trampling on the piglets; [1mk.]
  - [b] Dunging area;-Exercise area;-Basking area for piglets;-Resting area; [2mks.]
  28. [a] Wool shearing;[1mk.][b]-Shearing on a clean floor free from grease and oil;

- Done during a dry season;-Care taken not to cut skin,testicles,udder,teats; [3mks.]
29. [a] Stores food temporarily;-Moisten the food; [[2mks.].
- [b] Contains micro organisms that digest cellulose. [1mk.]

**SECTION C[40 MARKS]**

30. [a]
- A young animal not parturated more than three times;-Productive animal from records or productive parents;- Physically fit with no deformities;-Healthy;
  - Body conformation that adheres to the type of the animal;-Temperament or behavior that shows docile and calm;- Good quality products ;-Mothering instinct that is good;-Adaptable to the climatic conditions;-Prolific in bringing forth many off springs.[10mks.]
- [b]
- Cause anemia by sucking a lot of blood;-Deprive host food causing emaciation;-Damage tissues and organs exposing the host to secondary infection;-Spread diseases to healthy animals;-irritate the host causing rubbing against obstacles and damaging skin and coat;-Cause obstruction of internal organs leading to constipation;[5mks.]
- [c]
- Burning infested pastures kills all stages of ticks;-Ploughing the pasture desiccates the ticks in the sun;-Top dressing the pasture with lime or acaricide;-Fencing the pasture keeps away strange animals;-Rotational grazing and pad docking starves the ticks to death;-Hand picking the ticks and killing them;[5mks.]
31. [a]
- Lack of food ;-Outbreak of parasites and diseases;-Sun lights over heating the bee hive ;-Bad smell from the surrounding areas;-Presence of more than one queen;-Infertility of the queen;[5mks.]
- [b]
- Clean and disinfect far rowing pen;-Place dry ,warm bedding in the pen;-Provide a far rowing crate;-Wash the sow with water and soap;-Dust with an appropriate chemical to control external parasites ;-Isolate the sow to the far rowing pen 3 days before far rowing;[5mks.]
- [c]
- Cause---virus/burna virus[1mk.]
  - Attacks---poultry/birds [1mk.]
  - Symptoms are:
  - Gland above the vent swells/bursa ;--Egg production declines ;-Birds develop respiratory distress ;-Loss of appetite/low water intake ;-Drooping wings ;-Hemorrhage of the muscles /swollen liver/spleen/kidneys;- Restlessness;-Birds are sleepy .[6mks.]
- Control:-Vaccinate the birds ;-Farm hygiene ;-Administering vitamins B2;[2mks.]
32. [a]
- Cheap to acquire;-Work out put higher than human power;-Does not require skills ;-Can work well in areas where tractor cannot operate like small rugged areas;-Can be used in steep/sloppy areas where a tractor cannot ;-Animals provide manure and biogas;[5mks.]
- [b]
- Increases efficiency of machines hence reducing wear and tear;-Cools the engine by dissipating the heat created by rubbing surfaces acting as a seal ;-Prevents rusting of stationery machinery;-Acts as a cleaning agent by absorbing dust, dirt, soot, and metal chippings from the oil to the sump ;[4mks.]
- [c]
- Availability of the materials ;-Workability of the materials ;-Durability of the materials ;-Strength of the materials ;-Cost of the materials ;-Use or purpose of the structure ;-Suitability of the material to the prevailing weather conditions;[6mks.]
- [d]
- High standards of cleanliness ;-Dryness and warmth of the pen;-Adequate space for feeding ,watering exercise; - Proper lighting ;-Proper drainage ;-Draught free as a precaution against pneumonia ;-Proper ventilation ;-Single housing to avoid infection .[5mks.]

**KURIA EAST SUB-COUNTY JOINT EXAMINATION COUNCIL 2015***Kenya Certificate of Secondary Education (K.C.S.E)***443/1****AGRICULTURE****PAPER 1****JULY/AUGUST 2015****SECTION A (30 MARKS)****Answer All the questions in this section in the spaces provided**

1. Differentiate between olericulture and pomoculture as used in crop production. (1 mk)
2. State **four** advantages of drip irrigation. (2 mks)
3. State **four** advantages of adding organic manure to a sandy soil. (2 mks)
4. State **four** advantages of applying lime as a measure of improving soil condition. (2 mks)
5. Define the following terms as used in agricultural economics.
  - a) Gross Domestic Product (GDP) (½ mk)
  - b) Per capita income (½ mk)
6. State **four** benefits of budgeting to a farm manager. (2 mks)
7. State **four** activities carried out by Young Farmers Clubs in Kenya. (2 mks)
8. Distinguish between intensive hedgerow and border planting forms of agroforestry. (2 mks)
9. Give **four** reasons why land should be prepared early in readiness for planting. (2 mks)
10. State **four** reasons for intercropping. (2 mks)
11. Outline **two** conditions under which the opportunity cost is zero in a farming enterprise. (1 mk)
12. List **four** types of financial books a farmer should keep. (2 mks)
13. a) State **two** reasons for treating water before use in a farm. (1 mk)
- b) Give **two** methods of storing water in a farm. (1 mk)
14. a) List **four** disadvantages of communal land tenure system. (2 mks)
- b) Outline **four** aspects of rainfall that affect agricultural production. (2 mks)
15. a) State **four** human factors that affect agriculture. (2 mks)
- b) State **two** characteristics of a good root stock for grafting. (1 mk)

**SECTION B (20 MARKS)**

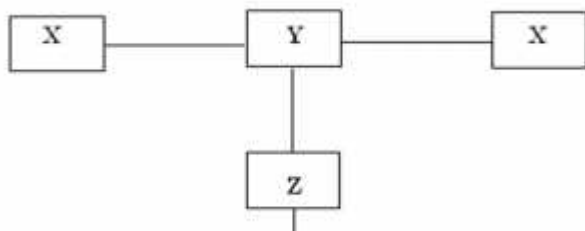
16. The transaction below shows Mr. Maginga's financial position in his farm business for the year 2004

|                           |             |
|---------------------------|-------------|
| Purchase of pesticides    | Kshs 3,000  |
| Milk sales                | Kshs 8,000  |
| Sale of goats             | Kshs 5,000  |
| Closing valuation         | Kshs 16,000 |
| Interest payable          | Kshs 1,750  |
| Veterinary bills          | Kshs 1,400  |
| Opening valuation         | Kshs 12,000 |
| Wages                     | Kshs 10,000 |
| Depreciation of machinery | Kshs 3,000  |
| Sale of one heifer        | Kshs 1,000  |

Prepare a profit and loss account for Mr. Maginga's farm.

(5 mks)

17. The diagram below illustrates a method of preparing compost pit manure, study the diagrams and answer the questions that follow.

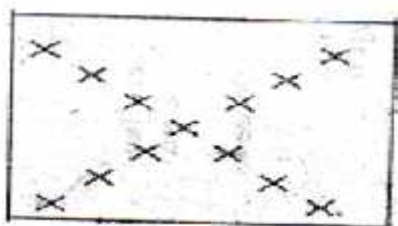


- a) Identify the method illustrated (1 mk)
- b) By using arrows between the boxes indicate the direction of movement of materials from X to the field. (2 mks)
- c) i) In regard to Y what is the volume of X? (1 mk)
- ii) How long should the materials stay in X and Y. (1 mk)

18. The diagram below illustrates an arable field crop. Carefully study the diagram and answer the questions that follow.



- a) Identify the field crop. (1 mk)  
 b) Name **two** common diseases that affects parts F and G. (2 mks)  
 c) List **four** cultural methods of controlling the diseases named in (b) above. (2 mks)
19. The diagram below shows a method of soil sampling.



- a) Identify the method. (1 mk)  
 b) Mention **four** areas to avoid when sampling soil. (2 mks)  
 c) Give **two** reasons for soil testing. (2 mks)

### **SECTION C (40 MARKS)**

**Answer any TWO questions from this section in the spaces provided after question 22.**

20. Describe various measures that can be carried out in a crop field to control crop diseases. (20 mks)
21. a) Explain the soil conservation measures that can be used to conserve soil on a sloping farmland (8 mks)  
 b) Explain any **six** factors considered when spacing crops. (12 mks)
22. Describe the establishment of cabbage under the following subheadings. (8 mks)  
 a) Nursery establishment and management (8 mks)  
 b) Land preparation (4 mks)  
 c) Transplanting (8 mks)

**KURIA EAST SUB-COUNTY JOINT EXAMINATION COUNCIL 2015**

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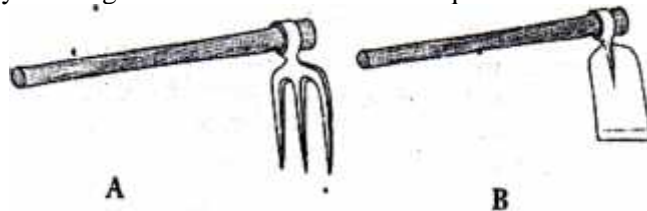
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**AGRICULTURE****PAPER 2****JULY/AUGUST 2015****SECTION A (30 MKS)**Answer all the questions in this section in the spaces provided

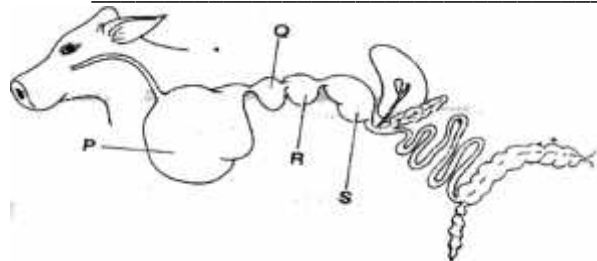
1. Name **four** breeds of dairy goats (2 mks)
2. Name **one** intermediate host for each of the following livestock parasites.
  - a) Liverfluke (*Fasciola Spp*) (1 mks)
  - b) Tapeworm (*Taenia Saginata*) (1mk)
3. Name **four** systems of a tractor engine. (2 mks)
4. Give **four** reasons for feeding a lamb on colostrum. (2 mks)
5. Give **two** causes of scouring in calves. (1 mk)
6. Outline **four** limitations of using hydroelectric power on the farm. (2 mks)
7. Give **four** main causes of livestock diseases. (2 mks)
8. State **four** factors that would determine maintenance ration in livestock production. (2 mks)
9. Give **two** uses of foot bath in a plunge dip. (1 mk)
10. Give **two** reasons why dehorning is done in livestock. (1 mk)
11. Name the tool used together with each of the following tools. (1 mk)
  - a) Canula -
  - b) Wood chisel -
12. State **four** non-chemical ways of controlling ticks (2 mks)
13. List **four** qualities considered when selecting eggs for incubation. (2 mks)
14. Mention **three** purposes of branding in cattle (1½ mks)
15. Differentiate between crutching and ringing in livestock management. (1 mk)
16. Name **three** methods used in selection of livestock. (1½ mks)
17. State **two** reasons for including roughage in the ration of non-ruminant. (1 mk)
18. Give **four** signs of heat in a rabbit. (2 mks)
19. List **two** material used in construction of a green house. (1 mk)

**SECTION B (20 MARKS)**Answer all questions in this section in the spaces provided.

20. Study the diagrams below and answer the questions that follow.



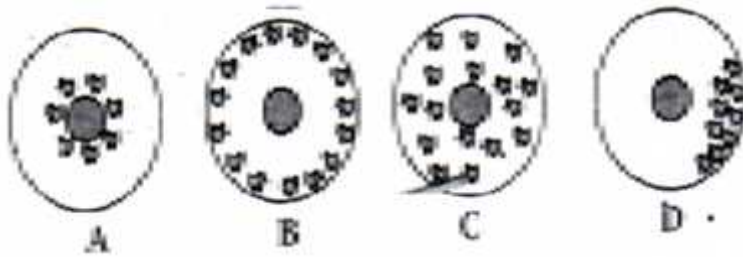
- a) Identify tool A and B (2 mks)
  - b) Under what conditions would you require to use tool A rather than tool B. (2 mks)
  - c) State **two** maintenance practices for the above tools. (2 mks)
21. Study the diagram of the digestive system of a farm animal shown below and answer the questions that follow.



- a) Name the parts labelled P, Q, R and S. (2 mks)
- b) State the function of the part labelled R. (1 mk)
- c) Give **two** reasons why livestock with the above parts are able to digest cellulose food material. (2 mks)

- d) In which parts labelled P, Q, R and S would a nylon paper be found if fed on by an animal with the above digestive system? (1 mk)

22. The following illustrations show the behaviour of chicks at different temperatures in a brooder.



- a) Explain the temperature conditions in each of the above diagrams: A, B, C and D. (4 mks)  
 b) State any **four** requirements of a good brooder. (4 mks)

### **SECTION C (40 MKS)**

**Answer any two questions from this section**

23. a) Differentiate between stress and vice in chicken (2 mks)  
 b) How would a farmer control stress and vice in poultry. (10 mks)  
 c) Describe the procedure of processing wax from honey combs. (8 mks)
24. a) Explain the types of stores that can be found on a farm (6 mks)  
 b) Explain **three** routine livestock feeding practices carried out when rearing livestock. (6 mks)  
 c) Describe **four** advantages and **four** disadvantages of using animal power in the farm. (8 mks)
25. Discuss the factors to consider when selecting a breeding stock. (20 mks)

**KURIA EDJEC**  
**AGRICULTURE**  
**PAPER 1**  
**MARKING SCHEME**

**SECION A (30 MARKS)**

**1. Differentiate between olericulture and pomology**

- Olericulture – Growing/ cultivation of vegetables
- Pomoculture – Growing/ cultivation of fruits.

*(1 x 1 = 1 mk) (mark as a whole)*

**2. Advantages of drip irrigation**

- It is economical in the use of water
- Water under low pressure can be used
- It minimizes instances of leaf fungal diseases
- It reduces growth of weeds between the rows
- Fertilizers may be applied with irrigation water
- It is suitable for sloping land
- It minimizes water loss through evaporation
- Accumulation of salts around plants is minimized.

*(4 x 1/2 = 2 mks)*

**3. Advantages of adding organic manure to a sandy soil**

- It increases the water holding capacity of the soil
- It improves soil fertility by releasing a wide range of nutrients into the soil.
- It provides food and shelter for soil micro-organisms responsible for the decomposition of organic matter.
- It improves soil structure
- It buffers soil PH
- Reduces the toxicity of plant poisons
- Humus which is mostly dark in color give soil its dark colour.

*(4 x 1/2 = 2 mks)*

**4. Advantages of applying lime**

- To amend soil PH/ to lower soil acidity
- To improve soil structure through flocculation of soil particles
- To supply calcium for plant nutrition
- To facilitate the availability and uptake of nitrogen and phosphorus.
- To improve drainage and aeration of waterlogged soils
- To improve microbial activities in the soil

*(4 x 1/2 = 2 mks)*

**5. a) Gross domestic product (GDP)**

- This is the sum total of all goods and services produced by a country within a period of one year.

*(1 x 1/2 = 1/2 mk)*

**b) Per capita income**

- This is the average income per person in a country.

*(1 x 1/2 = 1/2 mk)*

**6. Benefits of budgeting to a farm manager**

- It assists in estimating the resources required for production.
- It is useful when negotiating for farm credit from lending institutions.
- Important in decision making especially when comparing alternative projects.
- Helps to reduce uncertainty
- Encourages efficiency in order to meet projected targets.
- Helps in periodic assessment and analysis of farm business
- Assists in estimating future taxes on farm income.

*(4 x 1/2 = 2 mks)*

**7. Activities carried out by young farmers clubs in Kenya**

- Participating in exhibitions and competitions at A.S.K shows
- Involvement in agricultural projects at the club level
- Participation in YFC annual rallies
- Involvement in workshops and seminars related to agriculture
- Participating in national tree planting activities
- Participation in national ploughing contests
- Involvement and participation in exchange programmes both locally and abroad

*(4 x 1/2 = 2 mks)*

**8. Intensive hedgerow & border planting**

- Intensive hedgerow – trees or shrubs are planted between rows of crops
- Border planting – Trees or shrubs are planted on the borders of the farm.

*(Mark as a whole 2 mks)*

**9. Reasons why land should be prepared early**

- Allow time for weeds to dry and decompose
- Allow for proper soil aeration
- Allow timely planting/ subsequent operations
- Allow time for soil clods to disintegrate/ soften

*(4 x 1/2 = 2 mks)***10. Reasons for intercropping**

- Conserve soil/ water
- Maximize production
- Maximize utilization of nutrients in the soil
- Control weeds
- Control pests and diseases
- Diversification/ spread risks
- Maximize labour utilization/ save costs of labour
- Improves soil fertility if legumes are included
- Maximize utilization of land.

*(4 x 1/2 = 2 mks)***11. Conditions under which opportunity cost is zero**

- There is no alternative choice
- Goods are unlimited in supply
- A factor of production is freely offered.

*(2 x 1/2 = 1 mk)***12. Types of financial books a farmer should keep**

- Journal
- Inventory
- Cash book
- Ledger

*(4 x 1/2 = 2 mks)***13. a) Reasons for treating water before use**

- To kill disease causing micro-organisms
- To remove chemical impurities i.e excess fluoride
- To remove smells and bad taste
- To remove sediments of solid particles i.e sand and sticks.

*(2 x 1/2 = 1 mk)***b) Methods of storing water in the farm**

- Dams
- Weirs
- Water tanks

*(2 x 1/2 = 1 mk)***14. a) Disadvantages of communal land tenure system**

- There is no motivation to conserve land leading to land degradation
- There is no motivation to make long-term investments
- Land disputes are common
- It is difficult to carry out planning
- It is difficult to control pests and diseases
- An individual cannot use land as security to acquire farm credit or loan
- There are poor animal and crop husbandry practices thus leading to low yields.

*(4 x 1/2 = 2 mks)***b) Aspects of rainfall**

- Rainfall reliability
- Amount of rainfall
- Rainfall distribution
- Rainfall intensity

*(4 x 1/2 = 2 mks)***15. a) Human factors that affect agriculture**

- Level of education and technology
- Transport and communication
- Economy/ liberalization of economy
- Cultural and religious beliefs
- Health and HIUV/AIDS
- Market forces
- Government policies

*(4 x 1/2 = 2 mks)***b) Characteristics of a good rootstock for grafting**



- Healthy/ free from pests and diseases
- Compatible with different scions
- Resistant/ tolerant to soil borne diseases and pests
- Adaptable to different soil conditions

(2 x ½ = 1 mk)

**SECTION B (20 MKS)**

16.

**Mr. Maginga's Farm****Profit & loss account for the year ended 2014**

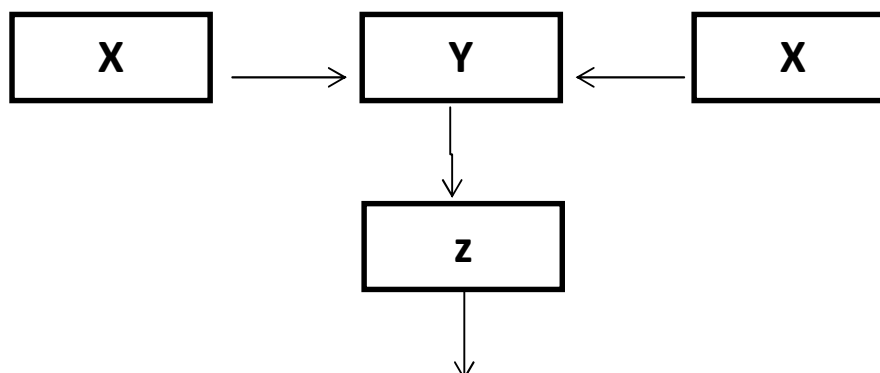
| Purchases & expenses      |               | Sales and receipts      |               |
|---------------------------|---------------|-------------------------|---------------|
| Opening valuation         | 12,000        | Sale of milk            | 8,000         |
| Purchase of pesticides    | 3,000         | Sale of goats           | 5,000         |
| Interest payable          | 1,750         | Sale of one year heifer | 1,000         |
| Vetennary bills           | 1,400         | Closing valuation       | 16,000        |
| Wages                     | 10,000        |                         |               |
| Depreciation of machinery | 3,000         |                         |               |
|                           | 31,150        |                         | 30,000        |
|                           |               |                         | 1,150         |
|                           | <b>31,150</b> |                         | <b>31,150</b> |

17. a) Method – Four heap system

(5 mks)

b)

(1 x 1 = 1 mk)



(4 x ½ = 2 mks)

- c) i) Volume of X = Half the size of Y  
 ii) 4 -5 weeks

(1 x 1 = 1 mk)

(1 x 1 = 1 mk)

18. a) **Sorghum**(compact panicle)

(1 x 1 = 1 mk)

b) **Common diseases**

- Part F – Smut
- Par G – Streak virus

(2 x 1 = 2 mks)

c) **Cultural methods**

- Burning crop residues
- Planting resistant varieties
- Rogueing/ burning affected crops
- Field hygiene
- Planting certified seeds.

(4 x ½ = 2 mks)

19. a) **Method** – traverse method

(1 x 1 = 1 mk)

b) **Areas to avoid**

- Dead forrows
- Terrace stands
- Old fence lines
- Old manure heaps/ compost pits
- Near trees/ boundaries

- Between slopes and furrow bottom
- Burned sites
- Recently fertilized farm
- Anti hills
- Near swampy/ water logged/ eroded areas

(4 x 1/2 = 2 mks)

c) **Reasons for soil testing**

- To determine the nutrients in the soil/ amount of fertilizers to use
- To determine the type of crop to grow
- To determine soil PH
- To determine whether liming is required or not.

(2 x 1 = 2 mks)

**SECTION C (40 MKS)**

**20. Various measures that can be carried out in a crop field to control crop diseases**

- Crop rotation – This helps to break the life cycle of pathogens/disease causing organisms.
- Rogueing/ destroying infected crops – This stops the disease from spreading further.
- Close season - It helps to break the life cycle of pathogens and disease vectors.
- Early planting/ timely planting – Enables the crop to establish faster before attack.
- Pruning –Creates an unfavourable micro-climate for some pathogens to survive
- Proper spacing – Minimizes disease spread in some crops
- Planting disease free/ use of clean planting materials/ use of certified seeds – This prevents introduction of pathogens into the field.
- Weed control – Controlling weeds prevents them from harbouring some pathogens.
- Application of appropriate chemicals – This kills the pathogens.
- Use of resistant varieties – The resistant varieties has a natural disease resistant ability.
- Seed quarantine – It prevents introduction of pathogens into the farms from other areas.
- Heat treatment – This kills micro-organisms that cause disease.
- Use of clean equipment – It reduces the chances of contamination of planting materials with pathogens
- Proper plant nutrition/ application of manure and fertilizer - This prevents deficiency diseases and enables establishment of vigorously growing crops that can resist disease attack. (Any 10 x 2 = 20 mks)

**21.**

a) **Soil conservation measures that can be used to conserve soil on a sloping farmland**

- Terracing – This reduces the spread of surface flow of water and hence its erosive power.
- Cut-off drains They divert water run-off from cultivated slopes through channels
- Trash lines or stone lines – Trash/ crop residues/ stones are heaped along contours to trap eroded soil.
- Gabions/ porous dams – these are boxes made of wire mesh and filled with stones. They are built across gullies to trap soil and reduce the speed of run-off.
- Dams/ Reservoirs – These are walls built across a valley to hold/ store water/ reduce speed of water
- Contour farming – farming operation are carried out along the contours
- Mulching – This involves the covering soil with dry vegetative materials to reduce speed of run-off, avoid splash erosion, reduce evaporation and increase the water holding capacity.
- Afforestation/ forestation/ Agroforestry – Trees protect the soil from splash erosion by reducing the force with which rain falls on the ground. They also acts as windbreakers
- Use of grass strip/ filter strip – Uncultivated strips of land are left internationally across the slope along the contour planting rows
- Cover cropping
- Use of grassed/ vegetated water ways. (8 x 1 = 8 mks)

b) **Factors considered when spacing crops**

- Soil fertility status – Crops can be spaced wider if the soil is infertile and close if soil is very fertile.
- Soil moisture content/ rainfall in the area – Drier areas require wider spacing than wet areas.
- Machinery to be used in subsequent farm operation - Crop whose operation will be mechanized is given wider space to allow for movement of machinery than that which will be manually managed.
- Intended purpose of the crop – Crops requires different spacing depending on their purpose e.g. maize for silage is spaced closer than that grown for grains.
- Growth habit of the crop/ size/ suckering/ tillering – plants that tiller or produce suckers tend to occupy a bigger area. They thus require wider spacing.
- Cropping system whether pure or mixed standards – Wider spacing is required for a crop to be interplanted than in a pure stand

- Height – Shorter crops require narrower spacing than taller crops.
- Number of seeds per hole – If more seeds are planted per hole, the spacing should be wider than if fewer or one seed is planted per hole. *(6 x 2 = 12 mks)*

## **22. Establishment of cabbage under the following subheadings**

### **a) Nursery establishment and management**

- Select a suitable site where members of the Brassica family have not been grown for the last three years.
- Dig the site deeply to remove all perennial weeds and stones
- Harrow the site to a fine filth
- Make shallow drills, 10 cm apart. The drills should be made evenly on the nursery bed.
- Place the seeds in the drills and cover them with light soil.
- Apply mulch material evenly on the nursery bed and water
- Remove the mulch after the seeds have germinated, then erect a shade over the nursery bed.
- Water the seedlings regularly
- Harden off before transplanting. *(8 x 1 = 8 mks)*

### **b) Land preparation**

- Prepare the land early enough when the weather conditions are dry. This allows enough time for the weeds to die
- Clean all vegetation and remove any tree stumps
- Plough deeply to remove all perennial weeds
- Harrow the land to a fine filth
- Make holes 10cm deep at a spacing of 90 cm x 60cm depending on the variety. *(4 x 1 = 4 mks)*

### **c) Transplanting**

- Cabbage can be sown directly into the field or first established in a nursery bed.
- Transplant the seedlings at the age of three to four weeks.
- Transplant during a cloudy or cool day
- Water the nursery bed thoroughly before transplanting
- Lift the seedlings with a ball of soil to avoid damaging the roots
- Water the field well before transplanting
- Apply handful of farmyard manure or one tablespoonful of double superphosphate to each hole.
- Apply suitable insecticides to control soil borne pests.
- Plant seedlings at the same depth as they were in the nursery.
- Firm the soil well around the base of the seedlings. *(8 x 1 = 8 mks)*

**KURIA EDJEC**  
**AGRICULTURE**  
**PAPER 2**  
**MARKING SCHEME**

1. Breeds of dairy goats
  - Saanen
  - Toggenburg
  - British Alpine
  - Anglo-Nubian
  - Jamnapari

*(4 x ½ = 2 mks)*
2. Intermediate host for
  - Liver fluke (*Fasciola*) – Fresh water snail
  - Tapeworm (*Taenia Saginata*) – Cattle

*(2 x 1 = 2 mks)*
3. Systems of a tractor engine
  - Fuel system
  - Electrical system
  - Ignition system
  - Cooling system
  - Lubricating system

*(4 x ½ = 2 mks)*
4. Reasons for feeding a lamb on colostrum
  - It is highly digestible suitable for digestive system.
  - It is highly nutritious and contains vitamins for growth and disease resistance.
  - It has anti-bodies that enable the lamb to resist early disease infection.
  - It is good in cleaning the bowel of the lamb (has laxative effect)
  - It is highly palatable

*(4 x ½ = 2 mks)*
5. Causes of scouring in calves
  - Use of dirty bucket in case of artificial feeding
  - Excess milk

*(2 x ½ = 1 mk)*
6. Limitations of using hydroelectric power on the farm
  - It is expensive
  - Most farms do not access to large quantity of moving water

*(4 x ½ = 2 mks)*
7. Causes of livestock diseases
  - Nutritional causes
  - Amount of food eaten by an animal
  - Physical causes
  - Chemical causes
  - Living organisms
  - Infectious disease causing organism

*(4 x ½ = 2 mks)*
8. Factors that determine maintenance ration in livestock production
  - Body size or weight of the animal
  - Age of the animal
  - Animals activities
  - Level of production

*(4 x ½ = 2 mks)*
9. Uses of footbath in a plunge dip
  - To wash the feet of the animals before they get into the dip wash.
  - Contain chemicals to control footrot.

*(2 x ½ = 1 mk)*
10. Reasons why dehorning is done in livestock
  - It prevents cattle from inflicting injuries on each other
  - To make the animal docile and easy to handle
  - For easy transportation and feeding
  - Prevents destruction of farm structures.

*(2 x ½ = 1 mk)*
11. Tools used together with
  - Canula – Trocar
  - Wood Chisel –

*(2 x ½ = 1 mk)*
12. Non-chemical ways of controlling ticks
  - Natural or Biological method

- Mechanical method
  - Burning the infested pastures
  - Interfering with or altering the ticks environment
  - Fencing off the pasture land and farm
  - Starving the ticks to death
  - Hand picking the ticks from livestock and killing them. (4 x ½ = 2 mks)
13. Qualities considered when selecting eggs for incubation
- Should be fertilized
  - Should be of medium size (55 – 60 gm)
  - Should have smooth shells
  - Should be oval in shape
  - Should be free of any cracks in the shells
  - Egg should be clean to ensure pores are open
  - Should not have any abnormalities e.g. blood spots.
  - Should be fresh i.e collected within one week.
  - Should not be stored for more than 8 – 10 days (4 x ½ = 2 mks)
14. Purposes of branding in cattle
- Facilitate identification of cattle incase of:
- Theft
  - Mixing of different herds in the pastures
  - Mixing of different herds in watering points (3 x ½ = 1 ½)
15. Differentiate between crutching and ringing
- Crutching – practice of cutting wool around the external reproductive organ o female sheep to facilitate mating and prevent infection
  - Ringing – is the practice of rimming wool around the sheath of the penis of the rams to facilitate mating. (2 x ½ = 1 mk)
16. Methods used in selection of livestock
- Mass selection
  - Progeny testing
  - Contemporary comparison (3 x ½ = 1 ½)
17. Reasons for including roughage in the ration of non-ruminant
- They give animal physical satisfaction
  - They facilitate digestion (2 x ½ = 1 mk)
18. Signs of heat in rabbits
- Restlessness
  - Frequent urination
  - Swollen vulva
  - The doe throws itself on its sides
  - She rubs herself against the wall or any other solid object.
  - The does tries to contact other rabbits in the next hutch by peeping through the cage walls. (4 x ½ = 2 mks)
19. Materials used in construction of a green house
- Metal or wooden frames
  - Translucent materials e.g. polythene sheets (2 x ½ = 1 mk)

### **SECTION B (20 MKS)**

20. a) Identification of tool
- A – Fork Jembe / Forked hoe
  - B – Jembe/ Hoe (2 x 1 = 2 mks)
- b) Conditions when you require to use tool A rather than tool B
- In a field infested with weeds which have rhizomes and stolons e.g. couch grass.
  - In strong grounds
  - In had grounds (2 x 1 = 2 mks)

c) Maintenance practices for the above tools

**Tool A**

- Clean and dry after use
- Replace the handle if broken
- Straighten prongs if bent by hammering
- Oil for long storage to prevent rusting
- Weld the prongs if broken
- Fix the handle firmly.

**Tool B**

- Clean and dry after use
- Keep the blade oiled and dry for long storage to prevent rusting
- Sharpen the cutting edge if blunt
- Flatten blade if dented by hammering
- Fix the handle firmly
- Replace the handle if broken

(2 x 1 = 2 mks)

21. a) Name the parts

P – Rumen

Q – Reticulum

R – Omasum

S – Abomasum

(4 x ½ = 2 mks)

b) Function of the part labeled R

Absorption of water

(1 x 1 = 1mk)

c) Reasons why livestock with the above parts are able to digest cellulose food material

- Their rumen contain micro-organisms that assist in digestion of cellulose
- They can regurgitate food back to the mouth for further chewing.

(2 x 1 = 2 mks)

d) Part Q

(1 x 1 = 1 mk)

22. a) Temperature conditions in

A – Chicks are crowding around the heat source because the temperatures are low.

B – Chicks have moved further away from the heat source because the temperatures are very high.

C – Chicks are evenly distributed within the brooder because the temperatures are favorable.

D – Chicks drift towards one side because the temperatures on the other side of the brooder are unfavorable, possibly due to the effect of draught on that side.

(4 x 1 = 4 mks)

b) Requirements of a good brooder

- Should be well aerated and warm
- Should have enough feed and water trough
- Should be clean
- Should be properly drained.

(4 x 1 = 4 mks)

**SECTION C (40 MARKS)**

23.

a) Differentiate between stress and vice in chicken.

- Stress is any cause of discomfort to the birds while vice is an abnormal behaviour in birds.

(2 x 1 = 2 mks)

b) How to control stress and vice in poultry production

- Stress
- Keep the poultry house quiet by building it away from the road where people and vehicle pass.
- Insulate the poultry house to maintain uniform temperatures
- Control disease and parasites
- Change of routine programme must be gradual.
- Provide enough feed and water.

Vice

- Collect eggs regularly
- Make nests dark
- Feed birds on balanced ration
- Debeak perpetual egg-eaters
- Supply green leaves to keep birds busy
- Scatter grains in the litter to enable the birds to scratch for them

(Any 10 x 1 = 10 mks)

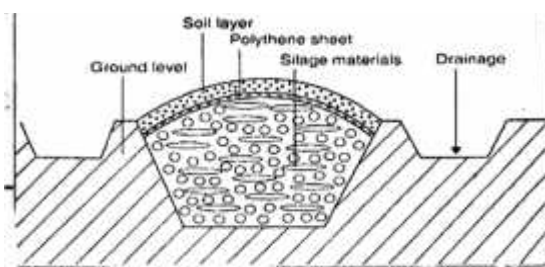
- c) Procedure of processing wax from honey combs
- Put combs whose honey has been extracted into a basin
  - Add water to the basin
  - Heat the mixture until the wax melts
  - Strain the mixture through a muslin cloth
  - Squeeze the residue strongly to force the wax out.
  - Cool the mixture overnight
  - Drain the water and remove any foreign particles.
  - Re-melt the wax over a water bath and put it in a container. (8 x 1 = 8 mks)
- 24.
- a) Types of stores that can be found on a farm
- Feed stores – they are used for storing animal feeds such as concentrates and mineral salts.
  - Farm produce stores – They are used for storing farm produce e.g. grains such as maize, beans and sorghum
  - Chemical stores – They are used for storing agro-chemicals such as drugs for treating livestock
  - Machinery stores – they are used for storing farm machinery such as tractors, ploughs e.t.c.
  - Tool stores – They are used for storing farm tools and equipment's (3 x 2 = 6 mks)
- b) Routine livestock feeding practices carried out when rearing livestock
- Flushing - Is the extra feeding of the females such as ewes, on high-quality feeds at least 2 – 3 weeks before and after mating.. It is done to increase the chances of conception.
  - Steaming up - Is the provision of extra feeds on high nutritive value to an animal during the last week of gestation.
  - Creep feeding - is the feeding of young animals such as lambs or piglets with high quality feeds, from birth to weaning (3 x 2 = 6 mks)
- c) Advantages and disadvantages of using animal power in the farm
- Advantages
- It does not require skilled workers as compared to engine power.
  - Animals are cheaper to buy and maintain compared to tractor engine power.
  - Work output from animals is highest than that of human beings
  - Animal can work in areas where it would be impossible for tractors
  - Animals work better on small holding than tractors (4 x 1 = 4 mks)
- Disadvantages
- Animals need a big portion of land for grazing as part of their maintenance.
  - They are slower than tractors and cannot cope with very large amount of lands.
  - Animals can damage crops when they are used for weeding
  - Animals sometimes get sick hence reduce their work output. (4 x 1 = 4 mks)
25. Factors to consider when selecting a breeding stock
- Age – Young animals, those that have parturated for not more than three times, should be selected. This is because they have a longer productive life.
  - Level of performance – only those animals with the highest production level should be selected.
  - Physical fitness – Animal selected should be free from any physical defects e.g. being mono-eyed, limping e.t.c
  - Health – Animal selected must be health. sick animals do no breed well and those feeling sick frequently are expensive to keep.
  - Body conformation – Animal for breeding should be selected according to their proper body conformation e.g. a dairy cow should be wedge-shaped with a large udder, thin legs, long neck.
  - Temperature or behavior – Animal for breeding should have good temperature i.e. should not have undesirable behavior e.g. cannibalism and egg eating in case of poultry.
  - Quality of products select animals that give products of high quality e.g. in wool production, breed that produce fine, long, elastic and pure white wool are selected.
  - Mothering ability – Animal selected should have a good mothering ability i.e. with good natural instinct towards their young ones.
  - Adaptability – Animal selected should be well adapted to the prevailing climatic conditions in the area.
  - Prolificacy – Animal selected should be highly prolific, that is animal with an ability to give birth to many offspring's at a time especially on pigs and rabbits. (10 x 2 = 20 mks)

**MURANG'A SOUTH SUBCOUNTY MULTILATERAL FORM 4 EXAM - 2015***Kenya Certificate of Secondary Education (K.C.S.E)***443/1****AGRICULTURE****PAPER 1**

1. State **three** properties of soil that are influenced by its texture (1 ½ mks)
2. Give **two** ways in which pastures are classified (1mk)
3. Suppose a farmer has to apply 30kg of P<sub>2</sub> O<sub>5</sub> per hectare and he had the fertilizer labelled 21:15:60 at this disposal, calculate the amount of P<sub>2</sub> O<sub>5</sub> he will require for two hectare of land (2mks)
4. State **two** main causes of silage loses (1mk)
5. Give the element whose deficiency in plants is characterised by the following
  - (a) Interveinal chlorosis of the leaves ..... (½ mk)
  - (i) Blossom end rot in tomatoes ..... (1½mk)
  - (ii) Scorched edges of a leaf ..... (½ mk)
6. State **four** characteristics of intensive farming (2mks)
7. Name **four** books of account kept by a farmer (2mks)
8. State **two** importance of flooding water in the field of growing rice (1mk)
9. List **four** reasons for using certified planting materials (2mks)
10. State **four** aims of land settlement programmes in Kenya (2mks)
11. State **two** causes of forking in carrots (1mk)
12. State **four** disadvantages of using herbicides (2mks)
13. Name **two** common diseases of cabbages (1mk)
14. State **two** methods used in frame formation in tea production (2mks)
15. State **four** factors that influence mass wasting as a type of soil movement (2mks)
16. State **two** importance of living organisms in soil (1mk)
17. State **four** ways in which trees help in land reclamation (2mks)
18. State **four** factors that determine crop population in maize field (2mks)
19. State **four** agricultural services available to a crop farmer (4mks)

**SECTION B ( 20 MKS)***Answer all questions in this section in the spaces provided*

20. The diagram below show a method of forage preservation



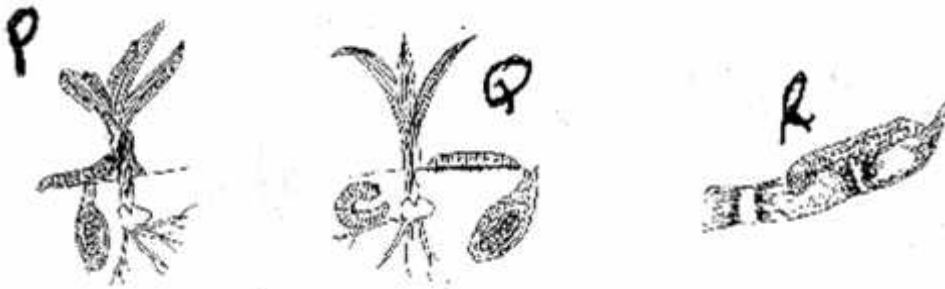
- (a) Identify the structure illustrated above..... (1mk)
  - (b) Give the role of each of the following in the above structure
    - (a) Polythene sheets ..... (½ mk)
    - (b) Drainage ..... (½ mk)
  - (c) State **two** other methods of forage conservation (2mks)
19. The following accounts of information is from Mr. Browns farm for the year ended 31/12/2013
- |                   |            |
|-------------------|------------|
| Opening Valuation | Kshs. 6000 |
| Paid Wages        | Kshs. 5000 |
| Bought equipments | Kshs. 4000 |
| Sold mature pigs  | Kshs. 7000 |
| Bought drugs      | Kshs. 3200 |
| Sold maize        | Kshs. 3000 |
| Closing valuation | Kshs. 4000 |
- (i) Using the information above, prepare a profit and loss account for Mr. Brown's farm (4mks)
  - (ii) From the calculation in



(i) above, state whether Mr. Brown made profit or loss

(1mk)

22. The diagrams P, Q, R represents some crop pests, study them



(a) Identify the pests P and Q

(1mark)

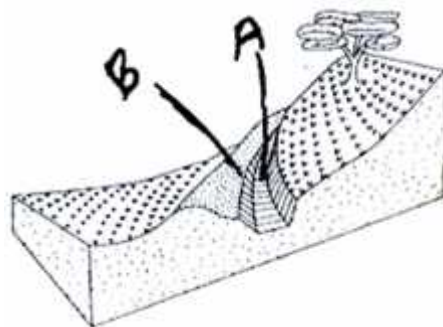
(b) Give the damage caused by pests P in maize production

(1mk)

(c) State **two** control measures of pests R

(2mks)

23. The illustration below shows a certain structure used in soil and water conservation, use it to answer the questions below



(a) Identify the structure

(1mk)

(b) Name the parts of the structure labelled A and B

(1mk)

(c) State other **two** physical structural methods used in soil and water conservation

(2mks)

24. The diagram below illustrates some weeds. Study them and answer the questions that follows



(a) Identify the weeds

(1mk)

(b) On the basis of plant morphology, classify the weed labelled L

(1mk)

(c) Give **two** harmful effects of the weed labelled M

(2mks)

### **SECTION C (40marks)**

*Answer any two questions in the spaces provided*

- 25 (a) Describe the advantages of mixed grass -legume pasture over a pure grass pasture (5mks)  
 (b) Describe factors that should be considered when deciding on the crop to grow (10mks)  
 (c) Outline **five** advantages of using seeds for crop propagation (5mks)
- 26 (a) State **four** disadvantages that a farmer experience when they use synthetic type of mulches (4mks)  
 (b) Explain the different physical methods used in crop pest control (16mks)
- 27 (a) Outline the role of phosphorous in plants (5mks)  
 (b) Describe the policies used by the government to regulate the amount of imported agricultural good in Kenya (5mks)  
 (c) Describe uses of farm records in the farm (10mks)

**MURANG'A SOUTH SUB COUNTY MULTILATERAL FORM 4 EXAM - 2015**

Kenya Certificate of Secondary Education (K.C.S.E)

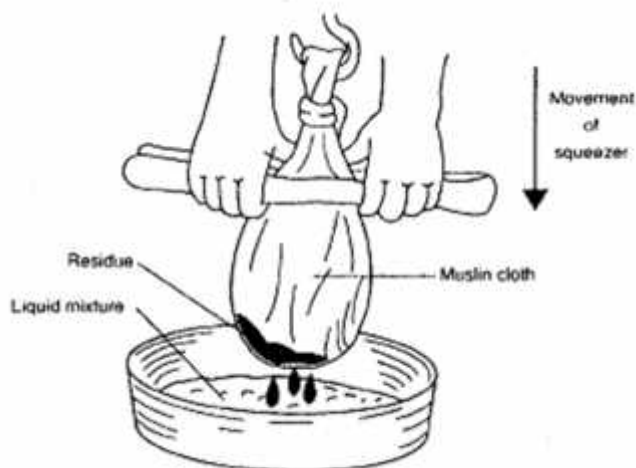
443/2

**AGRICULTURE****PAPER 2****SECTION A ( 30 MARKS)***Answer ALL questions in this section in the space provided*

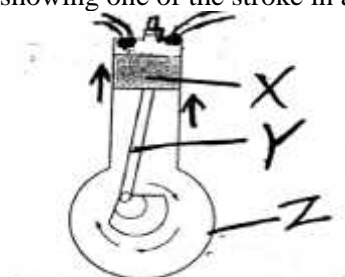
1. Name **three** methods of selecting livestock (1½ mk)
2. State **four** structural requirements if a calf pen (2mks)
3. State **four** practices that farmer should carry out to reduce egg eating in poultry (2mks)
4. State **three** mechanical methods of controlling ticks (1½ mks)
5. Give **two** physical characteristics of saddle back breed of pigs (1mk)
6. List **two** uses of clutch in a tractor (2mks)
7. State **four** predisposing factors of scours in calves (2mks)
8. State **four** demerits of live fences (2mks)
9. State **four** qualities of good creep feed (2mks)
10. Give **three** methods of treating timber for building construction (1½ mks)
11. State **three** qualities of good livestock ration (1½ mks)
12. List **two** sources of farm power that are environmental friendly (1mk)
13. State **four** factors that would contribute to depreciation of farm tools and equipments (2mks)
14. State **four** practices carried out on the fish before preservation (2mks)
15. State **four** methods of maintaining good health in livestock (2mks)
16. State **four** causes of stress in flock of birds (2mks)
17. What is meant by dry cow therapy as used in agriculture (1mk)
18. Distinguish between pen mating and flock mating in poultry management (2mks)

**SECTION B ( 20 MKS)***Answer all questions in this section in the spaces provided*

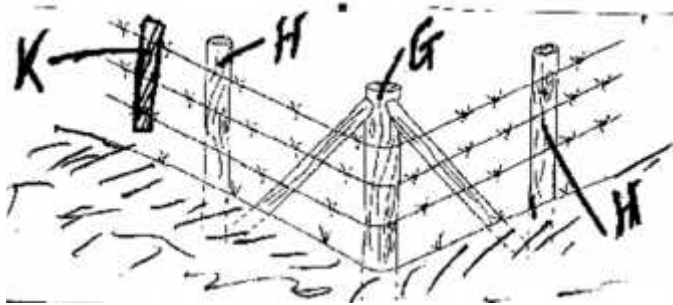
19. Study the diagram below and answer the questions that follow



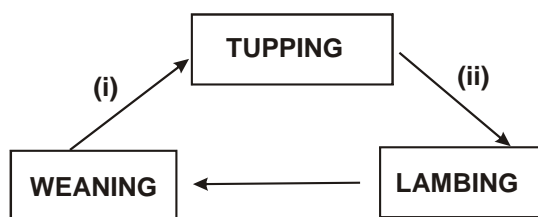
- (a) Identify the method illustrated above (1mk)
  - (b) Name **two** alternative methods of obtaining the product other than the one illustrated above (1mk)
  - (c) State **two** factors that determine the quality of the product given in the above illustration (2mks)
20. Below is a diagram showing one of the stroke in a tractor engine . Use it to answer the questions that follow



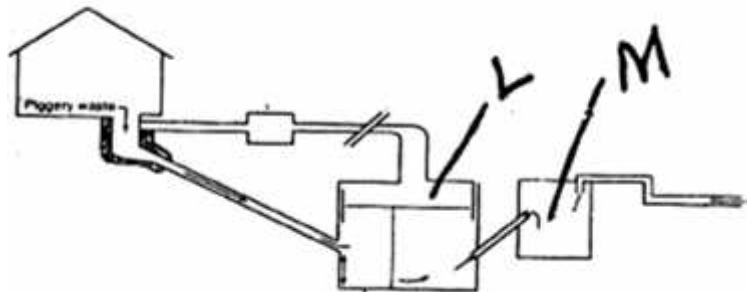
- (a) Identify the stroke ..... (½ mk)  
 (b). Name the parts labelled (1½ mk)  
 (c) Briefly describe the stroke in (a) above (2mks)
21. Below is a diagram of farm structure .Study it and answer the questions that follow



- (a) Identify the structure illustrated above. (1½ mk)  
 (b) Name the parts labelled G, H & K  
 (c) State **two** maintenance practices carried out on the farm structure above (2mks)
22. Below is a breeding cycle of a ewe in relation to its feeding use it to answer the questions that follow



- (a) Which practices are shown by: -  
 (b) State **two** importance of practice (ii) above (2mks)
- 23 Study the diagram below of a biogas plant and answer the questions that follow



- (a) Name the main component of biogas that is trapped in part L (1mk)  
 (b) Give the name and use of the materials deposited in part labelled M (1mk)  
 (c) State **two** uses of Biogas on the farm (2mks)

### **SECTION C (40 MARKS)**

**Answer Two questions in this section in the spaces provided**

24. (a) State **five** reasons for keeping livestock healthy (5mks)  
 (b) Describe Newcastle disease under the following subheading  
 (i) Casual organism (1mk)  
 (ii) Signs of attack (7mks)  
 (iii) Control measures (2mks)  
 (c) Describe **five** microbial activities that take place in the rumen of ruminant animals. (5mks)
25. (a) Outline **five** advantage of artificial insemination (5mks)  
 (b) Describe factors that affect digestibility of feed in livestock (5mks)  
 (c) Describe the differencies between Petrol and diesel engines (10mk)
26. Give **five** harmful effects of liver flukes in sheep (5mks)  
 (b) Describe uses of fences in the farm (10mks)  
 (c) State **five** functions of water in farm body of dairy animals (5mks)

**MURANGA SOUTH SUBCOUNTY FORM FOUR**  
**AGRICULTURE 443/1**  
**MARKING SCHEME**

SECTION A

1. Properties of soil that are influenced by its texture
  - Water holding
  - Capacity
  - Aeration
  - Drainage
  - Capillarity
  - Fertility

3 x ½ = (1½ mks)
2. Ways in which pastures are classified
  - According to pasture stand
  - According to pasture establishment
  - According to ecological zones

(½ x 2 = (1mk)
3.  $(\frac{30}{15} \times 100) = 200\text{kg P}_2\text{O}_5$   
 2ha = 200 x 2 = 400kg P<sub>2</sub>O<sub>5</sub>

(3 x 2 = (2mks)
4. Main causes of silage losses
  - Surface spoilage due to exposure and contact with soil
  - See page losses
  - Gaseous /loses/volatilisation

(½ x 2 = (1mk)
5. (a) Inter-veinal chlorosis of leaves  
 Magnesium ½ x 1 = (½ mks)  
 (b) Blossom end rot in tomato fruits  
 Calcium ½ x 1 = (½ mks)  
 (c) Scorched, edges of a leaf  
 Potassium ½ x 1 = (½ mks)
6. Characteristics of intensive farming (2mks)
  - High capital investments per unit area
  - High labour investments per unit area
  - High yield per unit areas
  - High level of management
  - Use of skilled labour
  - Modern technology applied

½ x 4 = (2mks)
7. Books of account kept by a farmer
  - Ledger
  - Inventory
  - Cash book
  - Journal

½ x 4 = (2mks)
8. Importance of flooding water in the field of growing rice
  - Control weeds
  - For growth of rice
  - Control some pests

½ x 2 = (1mk)
- 9 Reasons for using certified planting materials
  - Give rise to vigorous growing plants
  - Have high percentage of germination
  - Free from foreign materials
  - Usually high yields
  - True to type - Not contaminated with other varieties

½ x 4 = (2mks)
10. Aims of land settlement programmes in Kenya
  - To settle landless people
  - To ease population pressure in densely populated areas
  - To create self employment
  - To increase agricultural production

½ x 4 = (2mks)
11. Causes of forking in carrots

- Conditions of heavy soils
- A lot of undecomposed organic matter /manure in the soil  $\frac{1}{2} \times 2 = (1 \text{ mk})$
- 12. Disadvantages of using herbicides in the farm
  - Requires technical knowledge to apply
  - Herbicides are expensive
  - Are poisonous to the users & other organisms
  - May cause pollution to the environment  $\frac{1}{2} \times 4 = (2 \text{ mks})$
- 13. Name two common diseases of cabbages
  - Downy mildew
  - Damping off
  - Black root  $\frac{1}{2} \times 2 = (1 \text{ mk})$
- 14. Methods used in frame formation in tea
  - Pruning method
  - Pegging method  $\frac{1}{2} \times 2 = (1 \text{ mk})$
- 15. Factors that influence mass wasting
  - Slope of land
  - The nature of materials
  - Climate
  - Vegetation cover
  - Human activities
  - Forces with the earth's crust  $\frac{1}{2} \times 1 = (1 \text{ mk})$
- 16. Importance of living organisms in soil formation
  - Decompose organic matter
  - Fix Nitrogen in the soil
  - Breaks down rocks and soil particles
  - Decay to form organic matter  $\frac{1}{2} \times 1 = (1 \text{ mk})$
- 17. Ways in which trees help to land reclamation
  - Add organic matter through leaf fall thus recycle soil nutrients to soil surface
  - Help to control soil erosion
  - Improve drainage of swampy areas
  - Creating of suitable micro-climate  $\frac{1}{2} \times 1 = (1 \text{ mk})$
- 18. Factors that determine crop population in a maize field
  - Number of seeds per hole
  - Soil fertility
  - Moisture availability
  - Purpose of crop
  - Growth habit of crop
  - Size of the farm/land
  - Spacing used  $\frac{1}{2} \times 4 = (2 \text{ mks})$
- 19. Agricultural services available to a crop farmer
  - Training / educating
  - Crop research
  - Credit/loans
  - Banking
  - Farm input supply
  - Marketing

### **SECTION B - 20 MARKS**

- 20. Identity of structure illustrated
  - (i) Trench silo (Reject silo alone)  $1 \times 1 = (1 \text{ mk})$
  - (ii) (a) Role of polythene sheet  $\frac{1}{2} \times 1 = \frac{1}{2} \text{ mk}$   
To prevent entry of water into the silo
  - (b) Role of drainage  $\frac{1}{2} \times 1 = \frac{1}{2} \text{ mk}$   
To drain excess surface water
  - (iii) Other methods of forage conservation

|   |              |                   |  |
|---|--------------|-------------------|--|
| – Hay   |              |                   |  |
| – Standing forage   |              |                   | 2 x 1 = (2 mks)                        |
| 21 (i) <b>Expenditure</b>                                       | <b>Ksh</b>   | <b>Income</b>     | <b>Kshs</b>                            |
| Opening valuation   | 6000         | Sale of pig       | 7000                                   |
| Wages   | 5000         | Sale of maize     | 3000                                   |
| Equipments  | 4000         | Closing valuation | 4000                                   |
| Drugs   | 3200         | Total             | 14000                                  |
|   |              | Net loss          | <u>4200</u>                            |
| Total   | <u>18200</u> | Total             | <u>18200</u> ½ mark per entry (3½ mks) |
| (ii) Made a loss (18200 -1400)                                  | =            | 4200              | (1mk)                                  |
| 22 (a) P- Armyworm  |              |                   | ½ x 1 = (½ mk)                         |
| Q- cutworm  |              |                   | ½ x 1 = (½ mk)                         |
| (b) Damage caused by:   |              |                   |  |
| P- Feed on leaves leaving only midribs                          |              |                   | 1x1 = (1mk)                            |
| (c) <u>Control measures of R</u>                                |              |                   |  |
| – Early planting  |              |                   |  |
| – Roguing   |              |                   |  |
| – Burning infected remains of maize crops after harvesting      |              |                   | 2 x 1 = (2 mks)                        |
| 23 (a) <u>Identity of structure</u>                             |              |                   |  |
| Cut off drain /diversion ditch                                  |              |                   | 1 x 1 = (1 mk)                         |
| (b) A- Water channel  |              |                   | 1 x ½ = (½ mk)                         |
| B- Embankment   |              |                   | 1 x ½ = (½ mk)                         |
| (c) Physical/structural features of soil and water conservation |              |                   |  |
| – Bunds   |              |                   |  |
| – Terraces  |              |                   |  |
| – Gabions/porous dams   |              |                   |  |
| – Dams and Reservoirs   |              |                   |  |
| – Stones lines  |              |                   |  |
| – Trash lines   |              |                   | 2 x 1 = (2 mks)                        |
| 24 (a) <u>Identity of</u>                                       |              |                   |  |
| L- Chinese lantern  |              |                   | ½ x 1 = (½ mk)                         |
| M- Thorn apple  |              |                   | ½ x 1 = (½ mk)                         |
| (b) Broad leaved weed   |              |                   | 1 x 1 = (1mks)                         |
| (c) <u>Harmful effects of weed M</u>                            |              |                   |  |
| – Poisonous to man and his livestock                            |              |                   |  |
| – Compete with crop for water nutrients , space and light       |              |                   | (2x1 = 2mks)                           |
| 25 (a)  |              |                   |  |
| – It is more palatable  |              |                   |  |
| – Mixed pasture yields more per unit areas of land              |              |                   |  |
| – It is more nutritious /has higher nutrition value             |              |                   |  |
| – Make maximum use of soil Nutrients                            |              |                   |  |
| – Helps to reduce soil erosion because of good coverage         |              |                   |  |
| – Has better weed control                                       |              |                   |  |
| – Increases soil fertility because of N- fixation               |              |                   |  |
| – There is economic use of fertilisers                          |              |                   |  |
| – There is better distribution of growth                        |              |                   | 1x5= 5mks                              |
| (b)   |              |                   |  |
| – Gross margin  |              |                   |  |
| – Market  |              |                   |  |
| – Climate/temperature & rainfall                                |              |                   |  |
| – Diseases  |              |                   |  |
| – Pests   |              |                   |  |
| – Technology/skills   |              |                   |  |
| – Input availability  |              |                   |  |

- Soil type /fertility
  - Price fluctuation
  - Size of land
  - Government policy 1x4= 4mks
- (c) (i)
- Seeds are easy to store /not bulky
  - Seeds are easy to treat against soil borne pests & diseases
  - Seeds are easy to handle/make operations easier and faster
  - Manure or fertilizers can be mixed with seeds during planting
  - Seeds can be stored for a long time
  - Possible to develop new crop varieties due to cross pollination 1 x 5 = 5mks
- 26 (a)
- Prevent water infiltration
  - Raising of soil temperature
  - No modifying of soil Ph
  - They do not add Nutrients to the soil
  - They require skills to use 1 x 4 = 4mks
- (b)
- Proper drying of produce eg. grains to make them to hard for pest attack and discourage the growth of moulds
  - Flooding - To control suffocate cutworms armyworms moles
  - Suffocation - Use of cyprus bins to build up  $CO_2$  hence suffocate pests
  - Physical destruction of pests by hand picking them or trapping them then killing them
  - Use of scare crows to scare large animals and birds
  - Use of electromagnetic radiation- radio active radiations deactivates enzymes in insects and pests
  - Use of lethal temperature ie too not too cold conditions kill pests.
  - Use of physical barriers to trap pest e.g rat proof
  - grains stores fencing /uses of trenches to control large animals (2x8 = 16mks)
- 27 (a)
- Role of phosphorous
- Root development
  - Development of flower /flowering
  - Fruit and seed formation
  - Hasten ripening of fruits
  - Play role in metabolic processes e.g respiration
  - Take part in cell division and crop growth
  - Farms part of nucleo protein
  - Strengthen plant stem ( 5 x 1 = 5mk)
- b) Policies government use to regulate amount of imported agricultural goods
- Heavy taxation of imports in order to protect local industries
  - Subsidizing the growing of locally produced commodities
  - Quality controlled to ensure production of high quality goods for export and domestic market
  - Conservation of natural resources e.g fossils , water catchment areas, wildlife and soil
  - Stepping up to control diseases and parasites that affect crops and livestock
- c) Uses of farm records
- Help compare performances of different enterprises within the farm
  - Show the history of the farm
  - Guide farmer in planning and budgeting of farm operations
  - Help defect loses or theft on the farm
  - Help in assessment of income tax to avoid over or under taxation
  - Help determine value of the farm i.e determine assets and liabilities of the farm
  - Make it easy to share profits and loses in partnerships
  - Help in settling disputes eg when a farmer dies
  - Show whether the farm business is making profit or loss
  - Help in supporting insurance claims
  - Provide labour information like terminal benefits

**MURANGA SOUTH SUB-COUNTY FORM 4 MULTILATERAL EXAMINATION**  
**AGRICULTURE**  
**443/2 MARKING SCHEME**

Answer ALL questions in the spaces provided

1. Methods of selecting in livestock
  - Mass selection
  - Progeny testing
  - Contemporary comparison  $\frac{1}{2} \times 3 = (1\frac{1}{2} \text{ mks})$
2. Structural requirements of a calf pen
  - Adequate space/spacious
  - Single housing to prevent licking & hair balls in rumen
  - Proper lighting
  - Proper ventilation
  - Draught free  $\frac{1}{2} \times 4 = (2\text{mks})$
3. Practices that a farmer should carry out to reduce egg eating in poultry
  - Collect eggs regularly
  - Make nests dark
  - Debeak perpetual egg eaters
  - Supply green vegetation to keep birds busy
  - Give birds proper balanced diet  $\frac{1}{2} \times 4 = (2\text{mks})$
4. Mechanical methods of controlling ticks in livestock
  - Hand picking ticks and killing them
  - Burning infected pasture
  - Fencing of farm
  - Starving ticks to death  $\frac{1}{2} \times 3 = (1\frac{1}{2} \text{ mks})$
5. Physical characteristics of saddle back breed of pigs
  - Have long heads
  - Slightly dished snout
  - Slightly drooping ears  $\frac{1}{2} \times 2 = (1\text{mk})$
6. Uses of the clutch in a tractor
  - To connect or disconnect the drive shaft from the engine respectively
  - Enables the tractor drive take off gradually and smoothly  $\frac{1}{2} \times 2 = (1\text{mk})$
7. Predisposing factors of scours in calves
  - Poor sanitation
  - Feeding calf at irregular intervals
  - Lack of colostrum
  - Overfeeding  $\frac{1}{2} \times 2 = (2\text{mks})$
8. Demerits of live fences
  - Thorns may injure livestock
  - Take long to establish
  - Occupy large area/space
  - Rodents & thieves may hide in them  $\frac{1}{2} \times 4 = (2\text{mks})$
9. Qualities of good creep feed
  - Highly digestible
  - High energy content
  - Highly palatable
  - Rich in minerals & vitamins
  - High in digestible crude proteins  $\frac{1}{2} \times 4 = (2\text{mks})$
10. Methods of treating timber for building construction
  - Dry in the sun (seasoning)
  - Sap displacement
  - Pressure/vacuum treatment
  - Hot and cold soaking  $\frac{1}{2} \times 3 = (1\frac{1}{2} \text{ mks})$
11. Qualities of a good livestock ration
  - Highly digestible
  - Have balance nutrients



- Be palatable  
– Have no contaminations  $\frac{1}{2} \times 3 = (1\frac{1}{2} \text{ mks})$
12. Sources of farm power which are environmental friendly  
– Wind  
– Electricity  
– Solar power  
– Biogas  $\frac{1}{2} \times 2 = (1\text{mk})$
13. Factors that would contribute to depreciation of farm tools & equipments  
– Age of the equipment  
– Wear and tear/use  
– Exposure to weather (improper storage)  
– Change in technology i.e obsolescence  $\frac{1}{2} \times 2 = (1\text{mk})$
14. Practices carried out and fish before preservation  
– Cleaning fish to remove scales & slime  
– Removing the grit and intestines  
– Cleaning the abdominal cavity  
– Keeping the fish in open containers  $\frac{1}{2} \times 4 = (2\text{mks})$
15. Methods of maintaining good health in livestock  
– Proper feeding  
– Proper housing  
– Proper farm hygiene  
– Routine vaccination  
– Use healthy breeding stock  $\frac{1}{2} \times 4 = (2\text{mks})$
16. Causes of stress in a flock of birds  
– Overcrowding  
– Disease parasites  
– Imbalance diet  
– Sudden change of weather  
– New birds in old flock  
– Lack of enough feed & water  $\frac{1}{2} \times 4 = (2\text{mks})$
17. Dry cow therapy  
Infusion of mastitis control antibiotics into the teat canal to control mastitis after lactation / drying the cow  
 $1 \times 1 = (1\text{mk})$
18. Distinguish between pen mating and flock mating in poultry management  
– Pen-mating- is the use of only one cock to mate flock of hens  
– Flock mating - is where two or more cocks are used for mate hens  $2 \times 1 = (2\text{mks})$

### **SECTION B - 20 MARKS**

- 19 (a) Identify of method  
Crushing and staining  $\frac{1}{2} \times 1 = (\frac{1}{2} \text{ mks})$   
(b) Heat method  
Centrifugal  $\frac{1}{2} \times 2 = (1\text{mk})$   
(c) Factors determining quality of honey  
– Maturity stage  
– Methods of harvesting  
– Methods of processing  
– Type of plant which nector are obtained
- 20 (a) Compression stroke  $\frac{1}{2} \times 1 = (1\frac{1}{2} \text{ mks})$   
(b) X- piston  
Y- Connecting/piston rod  
Z- Crankcase  $= (1\frac{1}{2} \text{ mks})$   
(c) Describing compression stroke  
– Both inlets and outlets valves closed  
– Piston moves upwards  
– Fuel air mixture compressed  $(2 \times 1)$
21. (a) Barbed wire fence  $(\frac{1}{2} \text{ mks})$

- (b) G- King corner post (½ mks)  
K- Dropper (½ mks)
- (c) Maintenance practices of the structure
- Loose/singing wires should be straightened using wire structures
  - Worn out rails/posts should be repaired
  - Broken brace & droppers should be replaced
- 22 (a) Practices
- (i) Flushing 1x1 = 1mk
  - (ii) Steaming up 1x1 = 1mk
- (b) Importances of steaming up
- Give ewes good conditions for paturation
  - Facilitate foetal development
  - Increase/maintain high milk yield after birth
  - Ensure birth of a healthy lamb
- 23 (a) Components of biogas trapped in part
- L- methane gas 1 x 1= 1mk
- (b) Materials deposited in point M
- Scurry used for manuring crops
- (c) Uses of biogas on the farm
- Cooking of heating
  - Lighting
  - Runnnig refrigerators
  - Operate some biogas engines
- SECTION C - 40 MARKS**
24. (a) Reasons for keeping livestock healthy
- Good health ensures a long productive life
  - Healthy animals give maximum production /high performances
  - Healthy animals grow fast and reach maturity early
  - Healthy animals produce quality products which fetch good prices
  - Healthy animals do not spread diseases
  - Healthy animals are not economical to keep / reduce production costs 1x5 = 5mks
- (b) New castle disease
- (i) Causal organism  
Virus
  - (ii) Signs of attack
    - Difficult breathing
    - Beaks remain wide open and necks are strained
    - Dullness
    - Birds stand with eyes closed at all the time
    - Loss of appetite / Anorexia
    - Nasal discharge which force the birds to shake their heads to clear it
    - Birds walk in a staggering motion since the nervous system is affected
    - Often the bird have their heads and wings drooping
    - Birds produce waterly greenish diarrrohea
    - Eggs laid have soft shell 1x7= 7mks  - (iii). Control measures
    - Vaccination during the first six weeks and then two to three monthly later
    - Quarantine
    - Kill the infected birds and burn them / proper disposal 1x2= 2mks
- (c) Microbial activities in the Rumens
- Fermentation of food
  - Synthesis of Vitamin B complex B<sub>1</sub>, B<sub>2</sub>, B<sub>6</sub> and vitamin K
  - Synthesis of amino acids from ammonia
  - Breakdown of proteins to peptides, amino acids and ammonia
  - Breakdown of carbohydrates and cellulose into carbon (iv) oxide volatile fatty acids 5x1= 5mks

(a) Advantages of Artificial insemination

- Semen of one superior bull can be used to serve many cows
- It control transmission of breeding diseases and parasites
- Prevents large bulls from injuring small cows
- Reduces expenses of rearing a bull
- Semen can be stored for a long time even after death of a bull
- Easier to control breeding
- Easy to control in breeding
- Eliminate dangerous bulls from the farm
- Sives that are unable to serve cows due to heavy weight or injury can produce semen 1x 5= (5mks)

(b) Factors that affect digestibility of feed in livestock

- Chemical composition of the feed
- Farm in which the feed is offered to the animal
- Species of the animal
- Ratio of energy to protein
- Quantity of feed already present in digestive system of the animal 1x5= (5mks)

(c) Differences between petrol and diesel enginesDiesel Engine

Uses diesel

- Ignited by compression
- Compression ratio is high
- Less efficient in fresh burning
- Only air is compressed
- Has injection pump
- Suited to heavy duty machinery/heavy in weight
- Has sediment bowl
- No spark plug/has infection
- Air and fuel mixed in cylinder

Petrol Engine

Uses petrol

- Uses petrol
- Compression ratio is low
- More efficient in fuel burning
- Air fuel mixture compressed
- Has a carburator
- Suited for light duty /light in weight
- No sediment bowl
- Has spark plug
- Air and fuel mixed in the carbinator 1 x 10 = 10mks

26 (a) Harmful effects of liver flukes in sheep

- Digestive upsets due to blocking of bile duct
- Emaciation/recumbency leading to death
- Destruction of liver tissues and haemorrhages
- Swollen lower Jaws/oedema in the jaws
- Swollen abdomen
- Anaemia due to sucking of blood 1 x 5 = 5mks

(b) Uses of fences in the farm

- Mark boundaries
- Help to keep wild animals and intruders from outside the farm /security
- Help to avoid boundary disputes
- Enable the farmer to practice mixed farming
- Facilitates rotational grazing
- Controlls movement of animal and people preventing formation of unnecessary paths in the farm
- Control spread of parasites and diseases by keeping off wild and stray animals from the farm
- Help the farmer to isolate or confine animals requiring special attention
- Enable the farm to control breeding by rearing different animals in different paddlocks
- Hedges acts as windbreakers
- Add beauty to the farm
- Add value of land for privacy 1 x 10 = 10mks

(c) Functions of water in the body of dairy animals

- Is a component of body cells and body fluids
- Transportation of nutrients from one part of the body to another
- Make cells turgid
- Used in the biochemical reactions in the body
- Regulate body , temperature

- Helps in excretion of waste product from the body
  - Forms animal products 1 x 5 = 5mks
- (iii) Changing the cycle
- Replacement of old bearing stems by or suckers
  - Done 4-6 years
  - Sucker removal stopped about it years before changing cycle and three suitable early spaced suckers selected and allowed to grow
  - Old stems are cut down after the said grow period . 1x3 = 3mks
- (b) Cultural methods of controlling pests
- Timely planting - crops likely to escape pest attacks e.g. maize escaper , maize stalk borers
  - Timely harvesting - enable crops escape an attack while still in the field e.g. maize by weevils
  - Proper tillage - expose soil borne pest
  - Close season - A susceptible crop to a certain pest is not grown for a period of time.
  - Trap cropping - planted before or together with the intended crop to attract the pests which are then destroyed.
  - Crop rotation - Crop preferred by a certain pest is alternated with less preferred one thus starving the pest to death
  - Planting resistant crop variety - Plants with natural protective mechanism against pest attack.
  - Field hygiene - Field kept free of pest harbouring materials.
  - Alteration of environmental conditions - creating of certain micro-climates unfavorable to some pest
  - Destruction of alternative hosts - removal of weeds that act as alternative hosts to reduce past infestation
  - use of clean planting materials - prevent introduction and spreading of crop pests .
  - Crop nutrition - good supply of nutrients through use of manures , fertilizers enable plants grow strong and able to resist pest attack .
  - Proper spacing - makes it difficult for pests to move from one plant to another .
  - Use of organic manure - Has been found to discourage contain pest e.g. eelworms
  - Irrigation - Control certain pests e.g. overhead irrigation in cabbages 1x3 = 3mk
25. (a) (i) Biotic factors that influence agriculture
- Pests - destroy crops in various ways e.g. feeding on plants, transmit diseases .
  - Parasites - They affect both plants and animals they destroy the animals through sucking blood and juices from plants .
  - Pathogens - Micro-organisms that causes diseases to plants and animals
  - Predators - kill and feed on others.
  - Pollinators - Enhance pollination in plants i.e. transfer pollen grains from the anthers to the stigma
  - Nitrogen fixing bacteria convert nitrogen of the air into nitrates 1x5 = 5mks
- 25.
- (a) Factors that determine spacing of crops
- Type of machinery to be used - spaces left to allow for movement of machinery
  - Soil fertility - fertile soil allow support in plant populations
  - Size of plant- Tall crop varieties require under spacing
  - Moisture availability - Areas with high rainfall require closer spacing .
  - Use of crop - Those to supply forage or silage spaced closely
  - Growth habit of crop - spreading and highly tillering ones require wider spacing.
  - Pest and disease control - proper spacing may make it difficult for pests to move from one plant to another. 1x5 = 5mks
- (b) Ways in which drainage is important as a land reclamation method
- Increase soil aeration- when excess water is removed, air fills the air spaces and crops roots get enough air for growth
  - Increase microbial activity – microorganisms increase in number due to proper aeration hence improved soil structure
  - Reduce soil erosion- well drained soils have high water holding capacity has increase water infiltration hence reduced runoff
  - Remove toxic substances - such are removed as water drains away
  - Raise soil temperatures - Drained soils improve the rate of which soil warms up for better plant growth.
  - To increase soil volume in drained soils the amount of soil around the root zone from which roots can easily get nutrients easily is increased 2x5 (10mks )

**KIRINYAGA CENTRAL SUB-COUNTY JOINT EXAMINATION - 2015**

Kenya Certificate of Secondary Education (K.C.S.E)

443/1

**AGRICULTURE****PAPER 1****SECTION A: (30 MARKS)**

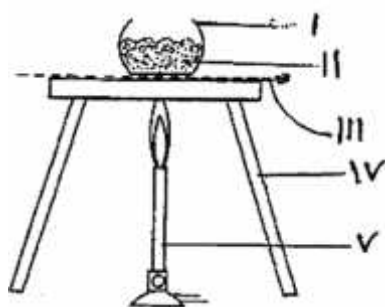
Answer all questions in this section in the spaces provided.

1. What is agroforestry? (1 mark)
2. Give **two** roles of agriculture in industrial growth. (1 mark)
3. Differentiate between intercropping and mixed cropping. (1 mark)
4. Name **four** financial documents used in the farm. (2 marks)
5. Give **four** types of micro catchments used in the farm. (2 marks)
6. State **four** sources of soil acidity. (2 marks)
7. State **two** advantages of carrying out pruning in banana production. (1 mark)
8. Given that a price of Ksh.100 per bag, 20 bags of maize are demanded, but when the price changes to Ksh.80 per bag, 22 bags are demanded. Calculate the elasticity of demand. (½ mark)
9. In maize hybrid 614 what do the following figures stand for? (1 mark)
  - (i) 6
  - (ii) 4
10. Give **two** ways in which pastures are classified. (1 mark)
11. State **four** properties of soil influenced by its texture. (2 marks)
12. Explain the meaning of the following terms as used in agricultural economics. (1 mark)
  - (i) Production function.
  - (ii) Equimarginal returns
13. Name **four** practices carried out to improve and maintain permanent pasture. (2 marks)
14. List **two** features of plastic pipes a farmer should consider before buying. (1 mark)
15. Give **four** advantages of tissue culture. (2 marks)
16. Give **three** stages of controlling devils horsewhip by mechanical means. (1½ marks)
17. State **four** functions involved on marketing of cabbages. (2 marks)
18. A farmer was advised to apply 40kg, P<sub>2</sub>O<sub>5</sub> per hectare of maize at planting time. The phosphatic fertilizer available was single superphosphate containing 20% P<sub>2</sub>O<sub>5</sub>.
  - (i) Calculate how much single superphosphate fertilizer she should apply in two hectares. (2 marks)
19. State **three** situation when the opportunity cost is zero. (1½ marks)
20. State **four** steps of gully formation. (2 marks)
21. Define what a partial budget. (½ mark)

**SECTION B: (20 MARKS)**

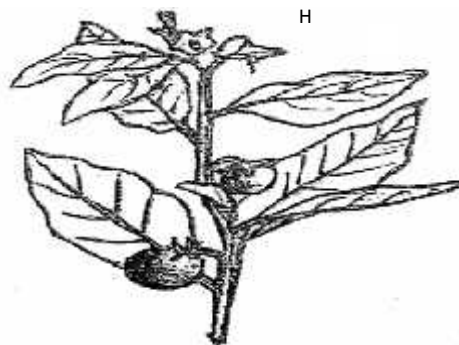
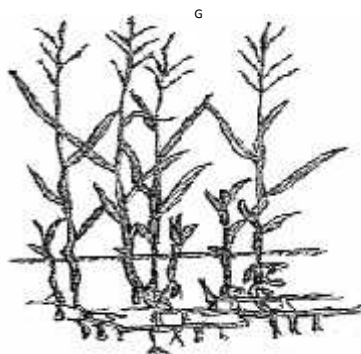
Answer all questions in this section in the spaces provided.

22. The diagram below shows a set up of apparatus for finding the percentage of humus contents in a soil by ignition.



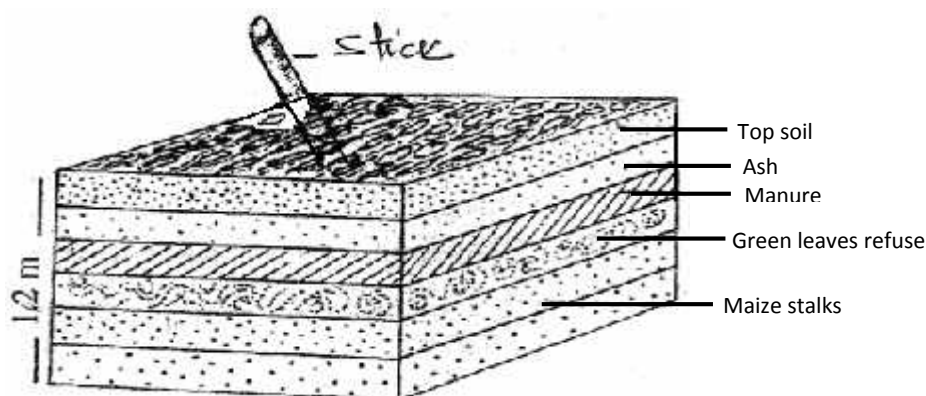
- (a) Label the apparatus. (2 marks)
- (b) Outline the steps followed in carrying out the illustrated experiment. (3 marks)
23. The following symptoms were noted on tomato seedlings in a farm.
  - (a) Stem cankers on seedlings.
  - (b) Spots on the seedling leaves.
  - (c) Defoliation and falling of leaves.
    - (i) Name the disease affecting the crops. (1 mark)
    - (ii) State a cause of the disease. (1 mark)
    - (iii) State **three** control measures for the disease. (3 marks)

24.



- (i) Identify the weeds. (2 marks)  
 (ii) State the economic importance of the weed shown in diagram G. (2 marks)  
 (iii) Why is it difficult to control weed in diagram G? (1 mark)

25. The diagram below shows preparation of organic manure.



- (a) Which type of organic manure is being prepared above? (1 mark)  
 (b) Give the importance of inclusion of the following layers. (4 marks)  
 (i) Ash  
 (ii) Topsoil  
 (iii) Manure  
 (iv) A stick

### **SECTION C: (40 MARKS)**

Answer any two questions from the section.

26. (a) Describe five objectives of agricultural research in Kenya. (10 marks)  
 (b) Describe ten cultural methods used to control pest. (10 marks)
27. (a) (i) What is open valuation? (2 marks)  
 (ii) What is closing valuation? (2 marks)  
 (iii) When is profit and loss account prepared? (1 mark)
- (b) Prepare a profit and loss account ending 31<sup>st</sup> Dec, 2003 using the following information. The farm made the following transactions. Purchased items listed below. (10 marks)

| Items                | Kshs. |
|----------------------|-------|
| Seed and fertilizer  | 3600  |
| Fuel worth           | 3400  |
| Livestock feeds      | 3000  |
| Machinery implements | 60000 |

The farm also expected the following:-

Kshs.5400 for vegetables sold to a neighbour school; Kshs.20,000 for beans sold, Kshs.10,000 for milk delivered to K.C.C. Kshs.46000 for coffee sold to local cooperative society. The farms opening valuation was Kshs. 80,000 and the closing valuation was Kshs.120,000.

- (i) Did the farm make a profit or loss? (1 mark)  
 (ii) How much profit or loss did the farm make? (2 marks)  
 (iii) Calculate the percentage profit of loss made. (2 marks)
28. (a) Discuss the human factors which influence agriculture. (10 marks)  
 (b) Explain **five** factors to consider when choosing the planting time. (10 marks)

**KIRINYAGA CENTRAL SUB-COUNTY JOINT EXAMINATION - 2015**

Kenya Certificate of Secondary Education (K.C.S.E)

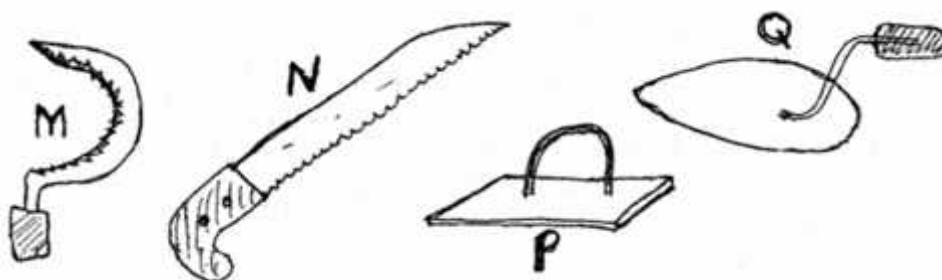
443/2

**AGRICULTURE****PAPER 2****SECTION A: (30 MARKS)***Answer all questions in this section in the spaces provided.*

1. Define the following terms as used in Agriculture.
  - (i) Brooding in poultry. (1 mark)
  - (ii) Flushing. (1 mark)
2. Give **four** advantages of carrying out raddling in sheep management. (2marks)
3. What is compression ratio? (½ mark)
4. Dorper breed of sheep breed was developed from two breed. Name them. (1 mark)
5. State **four** physiological parameters that can be used as indicators of ill health in livestock. (2 marks)
6. Outline **four** factors that should be considered when siting farm building and structures. (2 marks)
7. State the predisposing factors of the following livestock disease.
  - (a) Coccidiosis in poultry. (½ mark)
  - (b) Gumboro disease in poultry. (½ mark)
8. Name **four** light breeds in poultry. (2 marks)
9. State **four** functions of water in animal's body. (2 marks)
10. Give **three** functions of carburetor in a tractor. (1½ marks)
11. State when it is necessary to use a jembe instead of a plough. (2 marks)
12. (a) Give an intermediate host for the following internal parasites.
  - (i) Taenia saginate. (½ mark)
  - (ii) Taenia solium. (½ mark)
 (b) State **four** effects of parasites on host. (2 marks)
13. Define the following terms as used in animal production.
  - (i) Epistasis. (1 mark)
  - (ii) Heterosis (Hybrid vigour). (1 mark)
14. Give **four** reasons why farm tools should be properly maintained. (2 marks)
15. State **four** advantages of natural calf rearing. (2 marks)
16. State **three** importance of seasoning timber. (1½ marks)
17. State **three** functions of an egg shell. (1½ marks)

**SECTION B: (20 MARKS)***Answer all questions in this section in the spaces provided.*

18. Diagram M, N, P and Q represent farm tools.



- (a) Identify the tools. (2 marks)
  - (b) Give the use of each of the tools named above. (2 marks)
  - (c) State **two** maintenance practices that should be carried out on tool M. (1 mark)
19. A cow was diagnosed with the following symptoms, swollen feet, animal walking with limping gait, lameness and pus with rotten smell oozing out of the hooves and animals spending most time lying down.
- (a) Suggest the disease the animal was suffering from. (½ mark)
  - (b) Name the possible cause of the above disease. (½ mark)
  - (c) Apart from cattle name other two farm animals attacked by the above disease. (2 marks)
  - (d) State **four** control methods of the disease. (2 marks)

20. Below is an illustration of a farm operation. Study it carefully and answer the questions that follow.



- (i) What activity is being carried out? (½ mark)  
 (ii) Give **three** activities carried out on the animal before the above operation. (1½ marks)  
 (iii) Outline the procedure of carrying out operation. (3 marks)
21. (a) Define the term digestible crude protein. (1 mark)  
 (b) A farmer wanted to prepare 200kg of calf rearing ration containing 20% DCP. Using the Pearson's square method, calculate the amount of maize containing 10% DCP and sunflower containing 35% DCP the farmer would need to prepare the ration. (Show your working). (4 marks)

### **SECTION C: (40 MARKS)**

*Answer any two questions from the section.*

22. (a) Describe ten general methods of disease control in livestock. (10 marks)  
 (b) Describe the advantages of fences. (10 marks)
23. (a) Describe the principle of operation of four stroke (four cycle) petrol engine. (8 marks)  
 (b) Describe the rearing of fresh water fish in artificial ponds under the following subheadings.  
 (i) Types of fish reared. (2 marks)  
 (ii) Stocking of the pond. (3 marks)  
 (iii) Practices done to increase fish yield. (4 marks)  
 (iv) Cropping of fish. (3 marks)
24. (a) Give **ten** general characteristics of beef cattle. (10 marks)  
 (b) Describe the management of deep litter horse. (10 marks)



**KIRINYAGA CENTRAL SUBCOUNTY JOINT EXAMINATION - 2015****443/1****AGRICULTURE PAPER 1****MARKING SCHEME**

1. This is a farming method that involves growing crops keeping livestock and growing trees on the same piece of land. (Mark as whole) 1 x 1
- 2.
- Provides market for industrial goods.
  - Provides raw material for industries.
  - Provides capital to start or expand industries. (2 x ½ = 1mk)
3. Intercropping is growing of different crops in the same piece of land at the same time while mixed cropping is growing of different types of crops in the same field at the same time but at different sections.
4. Financial document.
- Invoice, receipt, delivery note, purchase order. (Mark as whole)
5. Types of micro catchments.
- Triangular/V-Shaped/Negarims
  - Semi circular bunds
  - Trapezoidal bunds
  - Contour bunds
  - Planting holes (4 x ½ = 2mks)
6. Sources of soil acidity.
- Water logging.
  - Over use of acidic fertilizer.
  - Acidic rain.
  - Plant nutrient uptake. (4 x ½ = 2mks)
7. To attain high yields.
- Improve on the quality of bananas.
  - Helps to count banana weevil.
  - Crop reaches bearing stage early. (2mks)
8. Elasticity of demand =  $\frac{Q}{P} \times \frac{P_1}{Q_1}$
- $$Ed = \frac{(20 - 22)}{100 - 80} \times \frac{100}{20}$$
- $$= \frac{2}{20} \times \frac{100}{20} = \frac{2}{4} = \frac{1}{2} \text{ or } 0.5$$
9. Hybrid 614
- 1<sup>st</sup> no: 6 refers to the altitude in thousands of feet above sea level.
- 2<sup>nd</sup> : 1 refers to the number of crosses.
- 3<sup>rd</sup> no: 4 refers numbers to the serried number (2 x ½ = 2mks)
10. Classification of pastures.
- Form in which it appears e.g. pure or mixed pasture.
  - Nature of establishment e.g. Natural or artificial.
  - Altitude at which the crop grows well and high altitude.
  - Medium of low altitude. (2 x ½ = 1mk)
11. Properties of soil influenced by soil texture.
- Soil porosity/aeration.
  - Drainage.
  - Permeability, hence water retention capacity.
  - Capillarity, hence water distribution.
  - Stickers of the soil.
  - Cation exchange capacity hence soil PH. (4 x ½ = 2mks)
12. (i) P.F (Production Function)
- This is the physical relationship between inputs and outputs in the production. (½mk)
- (ii) Equi marginal returns.
- States that if the amount pf productive resources are limited they should be allocated in such a way that the marginal returns to those resource is the same in all alternative uses to which they are put. (½mk)

13. Four practices used to improve permanent pastures.
- Weed control/pest control.
  - Topdressing with nitrogen/manure.
  - Controlled grazing to avoid degeneration.
  - Cutting back dry and unpalatable stumps. (4 x ½ = 2mks)
14. Determinants of plastic pipes choice.
- Durability.
  - Size.
  - Thickness.
  - Cost.
  - Colour of the pipe in rotation to the type of installation. (2 x ½ = 1mk)
15. Advantages of tissue culture.
- The plantlets developed maintain parental characteristics e.g. uniformity.
  - Disease free plants are obtained.
  - Mass production of planting materials.
  - High yielding crop clones are produced. (4 x ½ = 2mks)
16. Control of devils horsewhip mechanical means.
- Digging up.
  - Cleaning.
  - Collecting and burning. (3 x ½ = 1½mks)
17. Marketing functions involved in marketing of cabbages.
- Buying.
  - Selling.
  - Assembling by traders or middlemen.
  - Transportation to a large market/distribution.
  - Sorting out/grading/standardize.
  - Storage.
  - Processing.
  - Advertising/sales promotion
  - Financing.
  - Risk bearing.
  - Marketing research. (4 x ½ = 2mks)
18. 20kg P<sub>2</sub>O<sub>5</sub> contained in 100kg of SSP
- $$40 \text{ kg } P_2O_5 = \frac{40 \times 100 \times 2}{20}$$
- $$= 400\text{kg of SSP}$$
- Method 1 x 1 = 1mk  
Answer 1 x 1 = 1mk
19. When opportunity cost is zero.
- Free gift/donation.
  - When there is no alternative.
  - Unlimited supply.
  - Commodity is inherited (3 x ½ = 1½mks)
20. Steps of gulley formation.
- Movement of water from the watershed.
  - Erosion of the rills at the sides and bottom.
  - Enlargement of rills width through further erosion.
  - Further deepening of rills as a result of scouring of the channel floor by running water.(4 x ½ = 2mks)
21. What is a partial budget?
- Involves financial estimates representing an enterprise or enterprises changes for a short period of time in the farm. (1 x ½ = ½mk)
- SECTION B:**
22. (a) (i) Silica dish  
(ii) Humus rich soil  
(iii) Wire gauge  
(iv) Tripod stand (½ x 4 = 2mks)

- (b) Step followed in carrying out the illustrated experiment.
- Weigh the silica dish.
  - Collect garden soil from a depth of 20cm.
  - Put the soil in the dish.
  - Place the dish containing the garden soil over a (105°) in an oven for several hours.
  - Cool the soil and weigh.
  - Repeat the process until a constant weight is obtained.
  - Place the dish with the soil over a source of heat. (½ x 6 = 3mks)
23. (a) Early blight. (1 x 1 = 1mk)
- (b) Fungi (1 x 1 = 1mk)
- (c) Control measures.
- Use of healthy or treated seeds.
  - Use of fungicides.
  - Field sanitation by removing and destructing of all crops remains from the pervious seasons.
  - Planting resistance crops.
  - Crop rotation.
24. (i) G – Cough grass.  
H – Sodom apple. (1 x 2 = 2mks)
- (ii) Economic importance
- Compete for resources with cultivated crops.
  - It increases the cost of production.
  - Lower the quality of pastures. (1 x 2 = 2mks)
- (iii) It has deep underground structures difficult to remove, (1 x 1 = 1mk)
25. (a) Compost manure. (1 x 1 = 1mk)
- (b) (i) Ash – Improves level of phosphorus and potassium.
- (ii) Top soil – Introduces mirco-organisms necessary for decomposition.
- (iii) Manure – Provide nutrients to micro-organism (nourishment).
- (iv) A stick – To check the temperature. (1 x 4 = 4mks)

#### SECTION C:

26. (a) Objective of Agricultural Research in Kenya.
- Improve livestock production techniques.
  - Develop improved crop varieties and animals breeds.
  - Determine suitable ecological zones for various crop varieties and breeds that are resistant to parasites and field pests.
  - Produce varieties and breeds that are resistant to parasites and field pests.
  - Produce crop varieties and animals breeds that are tolerant to high temperature, poor pasture and drought.
  - Produce early maturing crop varieties and animal breeds.
  - Develop new techniques of pests and diseases control.
  - Develop breeds and varieties that are highly adaptable to new environment
  - Produce varieties that are highly yielding. (5 x 2 = 10mks)
- (b) Cultural methods used to control pests.
- Tillage – Expose pests to predators or sun killing them.
  - Control of weeds – Break life cycle or destroys breeding places.
  - Early planting – Minimizes attacks of crops.
  - Burning of crop residue – Kills eggs and pests found in crop residue.
  - Crop rotation – Break life cycle of pests.
  - Use of clean planting materials – Minimizes pest population.
  - Planting resistant crop varieties – Discourages breeding of pests.
  - Closed season – Denies the pests its favoutire crop.
  - Application of manure – Discourages some pests e.g. ell worm.
  - Proper pruning – Discourages breeding of some pests.
  - Timely harvesting – Crops escape attack.
  - Proper spacing – Discourages breeding of some pests.
  - Proper drying – Discourages attack by storage pests.
  - Growing of trap crop – Pests are trapped and destroyed.

- Field hygiene – Destroys pest together with crop residue. (1 x 10 = 10mks)

27.

- (a) (i) Opening valuation is the monetary value of all the business assets at the beginning of an accounting period. (2mks – mark as whole)
- (ii) Closing valuation is the monetary value of all the business assets at the end of an accounting period. (2mks – mark as whole)
- (iii) A profit and loss account is prepared at the end of an accounting period. (1 x 1 = 1mk)

(b) (i) **PROFIT AND LOSS ACCOUNT FOR KAGUMO FARM**  
**FOR THE YEAR ENDING 31<sup>ST</sup>**  
**DECEMBER 2003 ✓½**

| PURCHASE EXPENSE ✓½  |            | SALE AND RECEIPTS ✓½   |            |
|----------------------|------------|------------------------|------------|
| PARTICULARS ✓½       |            | PARTICULARS ✓½         |            |
| Opening valuation    | 80,000 ✓½  | Vegetables sale        | 5,400 ✓½   |
| Seeds and fertilizer | 3,600 ✓½   | Beans sale             | 20,000 ✓½  |
| Machinery implement  | 60,000 ✓½  | Milk to KCC            | 10,000 ✓½  |
| Fuel                 | 3,400 ✓½   | Coffee sale            | 4,600 ✓½   |
| Livestock            | 3,000 ✓½   | Closing valuation      | 120,000 ✓½ |
| Total purchases      | 150,000 ✓½ | Total sales + Receipts | 160,000 ✓½ |
| Profit               | 10,000 ✓½  |                        |            |
|                      | 160,000    |                        | 160,000    |

(½ x 20 = 10mks)

- (ii) The farm made profit.

(1 x 1 = 1mk)

- (iii) Profit = total sales and receipts – Total purchases and expenses  
= 160,000 – 150,000 (Working - 1mk)  
(Answer - 1mk)  
Total - 2mks

(iv) Percentage profit =  $\frac{\text{Profit}}{\text{Total sales \& receipts}}$   
=  $\frac{10,000}{160,000} \times 100$   
= 6.25%

28.

- (a) Human factors influencing agriculture.

- Level of education and technology – A more knowledgeable farmer produces high yields of high quality than an illiterate farmer.
- Health/HIV/AIDS – Sick farmers are less productive.
- Economy – Farmers with high capital goods produce more than a farmer with little capital.
- Transport and communication – Good roads available easy transport of inputs and outputs hence high yield.
- Market forces of demand and supply – the higher the demand the higher the produce and rise versa.
- Government policy – Government may subsidies prices of inputs to encourage production.
- Cultural and religious beliefs – Some cultures and religious beliefs may discourage or encourage production. (5 x 2 = 10mk)

- (b) Factors to consider when choosing the planting time.

- The onset of rains – Crops planted at the onset of rains establish early and make maximum used rains.
- Weather conditions and harvesting time – Crops e.g. cotton, maize and wheat need a dry season for ripening and harvesting hence planting can be delayed for a while.
- Prevalence of pests and diseases crops planted early escape attack from pests and diseases.
- Soil moisture content – Right moisture facilitates germination of seeds and allows early crop establishment.
- Make demand off season – Vegetables are always planted late to target high market demand when there is shortage of food supplies.
- Type of crop to be planted,

**KIRINYAGA CENTRAL SUB-COUNTY JOINT EXAMINATION - 2015****443/2****AGRICULTURE PAPER 2****MARKING SCHEME**

- 
1. (i) Brooding – Receiving of chicks from one day old up to 4 weeks in a brooder. (1 x 1 = 1mk)  
(ii) Flushing – Feeding extra feeds of high quality to sheep two to three weeks before mating to increase chance of conception. (1 x 1 = 1mk)
2. Advantages of carrying out raddling in sheep management.  
– To identify the sire of the lamb.  
– To identify barren awes.  
– To identify the infertile rams.  
– To identify the most fertile ewes. (½ x 4 = 2mks)
3. Compression ratio.  
The ration of the total amount of air in the cylinder to the amount of compressed air. (1 x ½ = ½mk)
4. Dorper breed of sheep was developed from two breeds – namely.  
– Blackhead Persian. (½mk)  
– Dorset horn (½mk)
5. Physiological parameters used as indicators of ill health in livestock.  
– Abnormal pulse rate, low or high.  
– Abnormal breathing (dyspnoca).  
– Abnormal body temperature.  
– Abnormal frequency of urination.  
– Bloody urine (haemoglobinuria) (½ x 4 = 2mks)
6. Factors considered when siting farm buildings and structures.  
– Wind direction. - Security of the area  
– Topography/drainage of the area. - Government regulations.  
– Accessibility of the area. - Room for future expansion  
– Existing amenities i.e. electricity, water supply. - Relationship between the structures.  
– Type soil. - Farmers preference. (4 x ½ = 2mks)
7. Predisposing factors of:  
(a) Coccidiosis. (b) Gumboro disease.  
– Wet litter (1 x ½ = ½mk) - Unhygienic conditions. (1 x ½ = ½mk)
8. Light breeds of poultry.  
– Minorca.  
– Leghorn.  
– Sykes.  
– Ancona. (½ x 4 = 2mks)
9. Functions of water in the animal's body.  
– Water acts as a solvent for chemical substances.  
– Medium of transport in the animal's body.  
– Help to regulate body temperature through evaporative cooling.  
– Help in maintaining solute – solvent balance in body fluids/osmoregulation.  
– Help in excretion of waste products from the animal body.  
– A component of body cells.  
– Required in chemical reactions that take place inside the animal's body.  
– Components of body fluids i.e. blood. (4 x ½ = 2mks)
10. Functions of carburetor.  
– Introduces air and fuel.  
– Atomises the fuel into tiny droplets.  
– Regulates the air fuel ratio by use of the choke and throttle respectively. (½ x 3 = 1½mks)
11. It is necessary to use a jembe instead of a plough.  
– When land is very steep.  
– Lack of technical skills in operation of plough.  
– When the size of land is small.  
– When adequate time is available.  
– When it is cost effective. (4 x ½ = 2mks)
-

12.

(a) Intermediate host for the following internal parasites.

(i) Tapeworm.

(ii) *Taenia saginata* – cattle.

(1 x ½ = ½mk)

(iii) *Taenia solium* – pigs.

(1 x ½ = ½mk)

(b) Effects of parasites on host.

- They transmit diseases.
- They deprive the host animal of food.
- They cause injury or damage to tissue and organs of the host.
- Cause irritation and discomfort to the host animal.
- Cause blockage or obstruction of internal organs.
- Cause anaemia by sucking blood from the hosts.
- Can lead to death of animal host.
- Cause loss of appetite or excessive appetite.

(4 x ½ = 2mks)

13. (i) Epistasis – A situation where different genes located in different chromosomes influence the outcome of another unrelated gene.

(1 x 1 = 1mk)

(ii) Heterosis – (Hybrid vigour).

It is improved performance of the offspring that comes about due to mating two animals with superior characteristics.

(1 x 1 = 1mk)

14. Reasons for proper maintenance of farm tools and equipments.

- To avoid injury to the user.
- To increase durability of the tool.
- To increase efficiency at work.
- To avoid cost of repair and replacement.
- To increase their resale value.

(4 x ½ = 2mks)

15. Advantages of natural calf rearing.

- The calf gets milk at the right temperature.
- Calf takes milk at its own pace.
- Chances of milk contamination are reduced.
- Low labour requirement.
- It makes better use of difficult milkers.

(4 x ½ = 2mks)

16. Importance of timber seasoning.

- To prevent harping or bending of timber.
- Controls insect damages.
- Reduces fungal attack.

(3 x ½ = 1½mks)

17. Three functions of an egg shell.

- Give the egg its shape.
- Prevent entry of diseases causing microorganism.
- Allow for gaseous exchange.

(3x ½ = 1½mks)

**SECTION B:**

18. Diagram.

M – Sickle

N – Pruning saw

P – Wood float

Q – Mason's trowel (4 x ½ = 2mks)

(b) Uses of tools

M – Harvesting crops i.e. rice, wheat etc.

– Cutting grass, cutting back pyrethrum.

N – P – Level or smoothen concrete and mortar

– Hold mortar before it is placed in position

Q – Laying on the mortar during construction (4 x ½ = 2mks)

(c) Replacing broken handles.

- Sharpening cutting edges.
- Oiling when and before storage.

(1 x 1 = 1mk)

19.

(a) The disease the animals was suffering from. - Foot rot.

(½mk)

(b) Possible cause of the above disease.

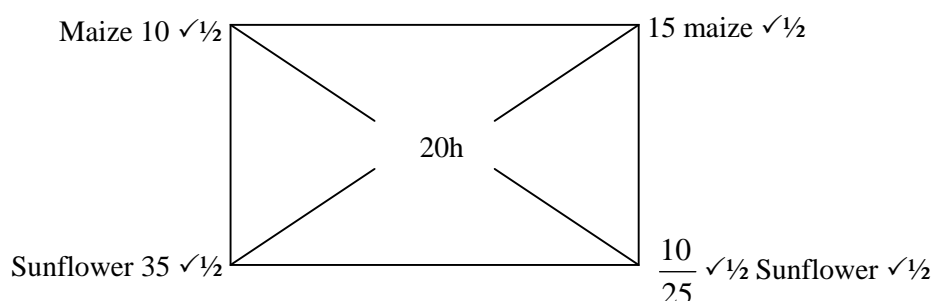
Caused by bacteria called fusiforms nacrothorus.

(½mk)

(c) Two farm animals by the above disease apart from cattle's.

- Sheep.

- Goat.
  - Pigs. (2 x 1 = 2mks)
- (d) Four control methods of the diseases.
- Hoof trimming.
  - Treat with antibiotics
  - Isolate sick animals
  - Avoid muddy conditions/hygiene
  - Allow animals to walk in footbath of copper-sulphate. (4 x ½ = 2mks)
20. (i) The activity illustrated is hand milking. (1 x ½ = ½mk)
- (ii) Activities carried out on the animals before hand milking.
- Restraining the animal.
  - Providing dairy meal/milking feed.
  - Washing the udder clean.
  - Assembling the milk equipment.
  - Wiping the udder dry.
  - Testing for mastitis. (3 x ½ = 1½mks)
- (iii) The procedure of milking.
- Assemble all the milking equipment
  - Put the coat in the milking shed and restrain it appropriately.
  - Wash the udder and teats using warm water mixed with a suitable sanitizing agent.
  - Dry the udder using a clean towel.
  - Use a strip cup to check for mastitis.
  - Carryout milking of the animal, strip the udder dry.
  - Dip the teat in anti-mastitis solution.
  - Apply milking jelly/milk salve on the teats.
  - Release the cow. Any (6 x ½ = 3mks)
21. (a) Digestible crude protein. The percentage of the protein and animal is able to absorb from a feed. (1 x 1 = 1mk)
- (b) Pearson square method of food compitation.



$$\text{Maize} = \frac{15}{25} \times 100 = 120 \text{ kg of maize} \quad \checkmark \frac{1}{2}$$

$$\text{Sunflower} = \frac{10}{25} = 80 \text{ kg of sunflower} \quad \checkmark \frac{1}{2}$$

- 22.
- (a) General methods of disease control in livestock.
- Use of prophylactic drugs – Animals are given drug routinely to control certain diseases e.g. chicken are given.
  - Use of antiseptic and disinfectants: They contain germicidal chemicals e.g. elecauning poultry or calf pen with disinfectant help control certain diseases/maintain hygiene's.
  - Qualantino – during an outbreak of certain notifiable disease like foot and mouth disease. Livestock movement is restricted to avoid spread of diseases.
  - Isolation – Animals suffering from certain dangerous disease e.g. scours and brucellosis are isolated to prevent the spread of the disease to the healthy ones.
  - Mass slaughter/culling: Animals suffering from certain dangerous diseases e.g. zoonotic disease like anthrax should be slaughtered in mass to eliminate the disease.
  - Vaccination: Animals are usually vaccinated against certain diseases e.g. lumpy skin disease/black quarter.
  - Control of vectors – Diseases carrying parasites e.g. Tsetse fly are controlled by spraying with appropriate chemicals or bush clearing to control diseases like nagana.

- Use of healthy breeding stock/AI healthy breeding stock or use AI help to prevent breeding diseases like brucellosis.
- Proper nutrition – well nourished animals are healthy and do not suffer from nutritional diseases like anaemia in piglets.
- Drenching/control of internal parasite. Internal parasites may cause diseases.
- Keeping resistant breeds of livestock. By keeping Zebu cattle occurrence E.C.F is reduced.
- Proper housing – this prevent diseases like pneumonia.
- Foot trimming – to minimize occurrence of foot rot. (1 x 10 = 10mks)

22. (a)

- Marking boundary/border.
- Keeps off thieves/intruders.
- Prevent damages of crops by crops.
- Control grazing in paddocks.
- Control breeding by separating males and females.
- Live fences act as windbreak.
- Fences help to control pests and diseases by controlling wild animals.
- Add aesthetic value.
- Live fence may provide livestock feeds or human fruit or firewood.
- Add value to the farm. (1 x 10 = 10mks)

23.

(a) Principle of operation of four stroke cycle engine.

(i) Induction stroke.

- The piston moves downwards in cylinder.
- This causes a partial vacuum on the upper part of the cylinder.
- The partial vacuum causes the inlet valve to open.
- The open inlet valve sucks in fuel and air mixture into the cylinder.
- The exhaust valve remains closed.

(ii) Compression stroke.

- The inlet and outlet valves remain closed.
- The piston moves up in the cylinder.
- The air fuel mixture is compressed in the cylinder.

(iii) Power/ignition stroke.

- The piston reaches the uppermost portion of the cylinder (top dead centre).
- The fresh air fuel mixture is fully compressed.
- The spark plug produces a spark.
- The spark ignites the fuel air mixture.
- The ignited mixture expands. The expansion creates pressure that forces the piston downward thus generating power.

(iv) Exhaust stroke.

- Piston moves up the cylinder.
- Exhaust valves opens.
- Exhaust gases are forced out.
- Inlet valves remains closed. (10 x ½ = 8mks)

(b) Rearing of fresh water fish.

(i) Type of fish reared – Tilapia, carp, trout, black bass, stripped bass and lung fish/mudfish, cut fish.

(2 x 1 = 2mks)

(ii) Stocking of the pond.

- Fingerings are obtained from reputable hatcheries.
- Water in this container should be 10°C.
- Care should be taken to avoid injury.
- Fingerings are introduced into the pond by lowering the container for them to swim out.
- Ensure the temperature of the pond water is the same as in the container.
- The stocking rate should be 5-10 fingerings per 5m<sup>2</sup> of the pond.
- Ensure the fingerings have enough food. (6 x ½ = 3mks)

(iii) Practices done to increase fish yield.

- Provide fish with enough food/manuring the pond to ensure growth of plankton/algae.



- Ensure the correct stocking rate/cropping to remove mature fish.
- Harvest only the mature fish.
- Ensure the correct depth of water/control silting/plan grass on the embankment to control erosion.
- Control predators/fish eating animals/provide fence around the pond.
- Ensure continuous flow of water/well created.
- Repair the broken/cracked walls/dykes.
- Clear the vegetation around the pond. (4 x 1 = 4mks)

## (iv) Cropping of fish.

- The removal of only marketable fish from the pond.
- Done using a sieve net of size 3 – 3.5cm.
- The small fish which pass through the sieve net holes are left in the pond. (6 x ½ = 3mks)

24.

## (a) General characteristics of beef cattle.

- Adapt well to a wide range of ecological conditions.
- Feed requirement is low.
- Water requirement is low
- Can feed on a variety of vegetation.
- Are heat tolerant.
- Are resistant to parasites and diseases.
- Can move long distances in search of water and pasture without lowering their performance.
- They breed regularly.
- Grow fast leading to early maturity.
- Blocky in shape.
- Short strong legs to support their heavy bodies.
- Efficient converters of food into meat and fat.
- - Have deep well fleshed bodies. (1 x 10 = 10mks)

## (b) Management practices of a deep litter.

- Put litter to depth of 10cm.
- Provide footbath at the entrance with a disinfectant
- Raise the litter once a week to improve aeration.
- Collect eggs thrice a day.
- Ensure ventilation which should be 60 -70cm above the ground.
- Roof should be strong for security.
- Provide clean adequate water on the feed trough.
- Ensure there is no leakage
- Provide girt.
- Provide greens and hang them. (1 x 10 = 10mks)

**KAHURU /KIHARU DISTRICT JOINT EXAMINATION – 2015**

Kenya Certificate of Secondary Education (K.C.S.E)

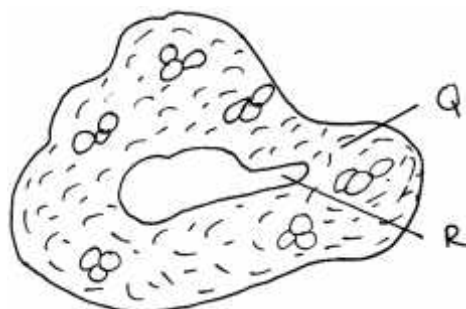
443/1

**AGRICULTURE****PAPER 1****SECTION A: (30 MARKS)***Answer all questions in this section in the spaces provided.*

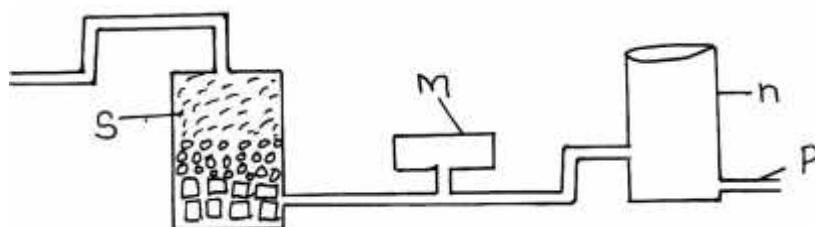
1. State **four** reasons for practicing agro forestry in Kenya. (2 marks)
2. State **four** disadvantages of organic mulching. (2 marks)
3. (a) What is stooking as used in maize production? (1 mark)  
(b) State the importance of stooking. (1 mark)
4. Why is per capita income not a good measure of economic performance of a country? (1 mark)
5. What is the use of a delivery note in farm accounts? (1 mark)
6. State **four** objectives of agricultural research. (2 marks)
7. Outline **four** factors considered when designing a crop rotation programme. (2 marks)
8. Outline **six** advantages of land consolidation. (3 marks)
9. State **four** factors influencing soil erosion. (2 marks)
10. Outline **four** conditions that necessitate irrigation. (2 marks)
11. Name **four** variable inputs in a maize production enterprise. (2 marks)
12. State **six** factors that affect the quality of hay. (3 marks)
13. Outline **two** reasons why a legume should be included when establishing forage crops. (1 mark)
14. State **four** advantages of tillage as a method of weed control. (2 marks)
15. Name **three** environmental factors affecting the effectiveness of herbicide. (3 marks)

**SECTION B: (20 MARKS)****Answer all the questions in the spaces provided.**

16. Below is an illustration of a soil structure. Study it carefully and answer the questions beneath.



- (a) Identify the type of soil structure illustrated above. (½ mark)
  - (b) Name the parts labeled. (2 marks)
  - (c) Name **two** areas where the structure is common within the soil profile. (2 marks)
17. The illustration below represents the last stages of a water treatment system. Study it carefully and answer the questions beneath.



- (a) Name the parts labelled. (1 mark)  
**M, n**
- (b) State one importance of: P, S (2 marks)
- (c) Briefly explain what happens to water as it passes through “M”. (2 marks)

18. Study the method of pruning illustration below and answer the questions that follow.



- (a) Identify the method of pruning illustration above. (½ mark)  
 (b) Give a reason as to why the management practice is carried out. (1 mark)  
 (c) Name **two** crops onto which the practice is applicable. (2 marks)  
 (d) Name **two** other methods of pruning field crop. (2 marks)
19. (a) State **four** factors considered in choosing the planting time. (2 marks)  
 (b) State **two** advantages of early planting. (2 marks)  
 (c) State **one** disadvantage of early planting. (1 mark)

### **SECTION C: (40 MARKS)**

**Answer any two questions in this section in the spaces provided after.**

20. (a) Briefly describe the agricultural services available to the farmers. (10 marks)  
 (b) (i) What is farm Budgeting. (1 mark)  
 (ii) Name **two** types of farm Budget. (1 mark)  
 (c) A farmer intends to change his enterprise from livestock production to crop production. The cost incurred is as follows.

The cost of livestock production includes.

|                   |              |
|-------------------|--------------|
| – Cost of cow     | Kshs. 15,000 |
| – Fencing         | Kshs. 3,000  |
| – Disease control | Kshs. 1,000  |
| – Milk man wager  | Kshs. 5,000  |
| – Spraying costs  | Kshs. 500    |

The cost of crop production includes.

|                        |             |
|------------------------|-------------|
| – Land preparation     | Kshs. 500   |
| – Seeds                | Kshs. 600   |
| – Planting             | Kshs. 800   |
| – Fertilizers          | Kshs. 1,500 |
| – Disease/pest control | Kshs. 1,200 |
| – Harvesting           | Kshs. 1,100 |

The revenue from milk sale is Ksh.25,000 and sale of calf Ksh.4,000 while the revenue he gets from sale of crops is Ksh.23,000. Draw up a partial budget and indicate whether the change is worthwhile or not. (8 marks)

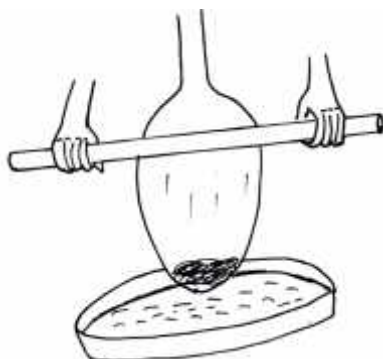
21. (a) Describe the various methods of drainage. (10 marks)  
 (b) State and explain **five** factors which influence pesticide efficiency. (10 marks)
22. Discuss the production of nappier grass under the following subheadings.
- (i) Seedbed preparation. (4 marks)  
 (ii) Planting (5 marks)  
 (iii) Fertilizer application. (3 marks)  
 (iv) Weed control. (3 marks)  
 (v) Utilization. (5 marks)

**KAHURO /KIHARU DISTRICT JOINT EXAMINATION – 2015***Kenya Certificate of Secondary Education (K.C.S.E)***443/2****AGRICULTURE****PAPER 2****SECTION A: (30 MARKS)****Answer all questions in this section in the spaces provided.**

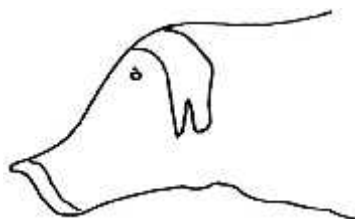
1. State **four** reasons that may discourage dairy farming in Kenya. (2 marks)
2. Outline **four** maintenance practices of a hack saw. (2 marks)
3. Name **two** methods used in disbudding. (1 mark)
4. Define line breeding. (1 mark)
5. Name **four** methods used in preserving fish. (2 marks)
6. Name **four** sources of carbohydrates in livestock nutrition. (2 marks)
7. What is the effect of increasing the tractor speed on the cut slice when using a disc plough? (1 mark)
8. Outline **four** routes through which disease Causing organisms get into the body of an animal. (2 marks)
9. Outline **three** precautions a farmer should take to avoid infection by brucellosis. (3 marks)
10. Highlight **three** reasons for keeping feeding records. (3 marks)
11. State **four** advantages of natural feeding in calf rearing. (2 marks)
12. Highlight **four** factors that affect maintenance requirements of an animal. (2 marks)
13. Name **two** developmental stages of a liver fluke. (1 mark)
14. State **four** reasons for feeding young calves on colostrum. (2 marks)
15. State **four** components of power transmission system. (2 marks)
16. State **four** factors that stimulate milk let down in a lactating cow. (2 marks)

**SECTION B: (20 MARKS)***Answer all the questions in the spaces provided.*

17. Study the illustration of processing honey below and answer the question that follow.

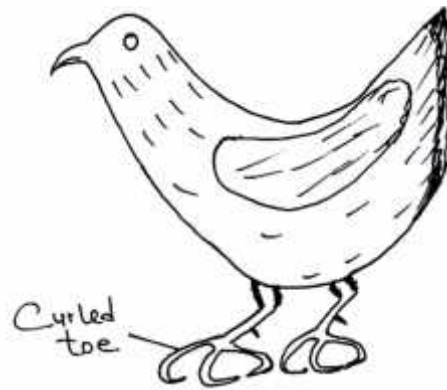


- (a) Name the part labelled. (2 marks)
  - (b) State the function of part labelled S. (1 mark)
  - (c) State **four** equipments used for harvesting honey. (2 marks)
18. The diagram below represents a method of livestock nurture management practice. Study it carefully and answer the questions beneath/below.



- (a) Identify the management practice represented above. (1 mark)
- (b) Name the farm tool used to carry out the management practice. (1 mark)
- (c) State **one** major precautionary measure taken when carrying out the above management practice. (1 mark)
- (d) Name **four** livestock animals which the management practice is carried out. (1 mark)

19. Study the illustration below and answer the question beneath.



- (a) What causes curled toes? (1 mark)  
 (b) State **two** other deficiency symptoms besides curled toe paralysis. (2 marks)  
 (c) State **four** sources of vitamin B<sub>2</sub>. (2 marks)
20. Animal power is a common means of transport in our country.  
 (a) Briefly explain the mechanism involved to enable them perform this practice. (3 marks)  
 (b) State **two** major factors which determine animals power efficiency. (2 marks)

**SECTION C: (40 MARKS)**

*Answer any two questions in this section in the spaces provided after.*

21. (a) Explain the reasons for feeding livestock on a balanced ration. (6 marks)  
 (b) Describe the preparation and management of natural incubation. (9 marks)  
 (c) Describe the body conformation features of a beef cattle. (5 marks)
22. (a) What are the advantages of farm mechanization. (5 marks)  
 (b) State **four** maintenance practices of a tractor battery. (4 marks)  
 (c) Describe parts of a disc plough. (5 marks)  
 (d) State the disadvantages of animal drawn implements as compared to tractor drawn implements. (6 marks)
23. (a) Outline **three** factors to consider when siting a calf pen. (3 marks)  
 (b) Name and describe the features of an ideal calf pen. (3 marks)  
 (c) What factors should a farmer consider when selecting materials for constructing a dairy cattle shed. (10 marks)

**KAHURO/KIHARU DISTRICT JOINT EXAMINATION – 2015****443/1****AGRICULTURE PAPER 1****MARKING SCHEME**

- 
1. **Reasons for practicing Agro-forestry in Kenya.**
- Trees act as wind breaks.
  - Provide the soil with organic matter.
  - Provide fire wood.
  - Conserve water by providing shade.
  - Provide fruits.
  - Some trees used as fodder for feeding livestock. (2 mks)
2. **Disadvantages of organic mulches.**
- Mulching materials maybe difficult to get in some areas.
  - Maybe a fire risk when dry.
  - Light rain showers may not reach the soil.
  - Some mulch materials release minerals which may cause nutrients imbalance.
  - The mulch may harbour pests e.g. rodents and ants.
  - The mulch may also be a source of fungal diseases. (2 mks)
3. (a) Stooking is cutting the maize and piled when upright in the field. (1 x 1 = 1 mk)  
 (b) Stooking hastens the drying of corps. (1 x 1 = 1 mk)
4. Per capita income is not a good measure of economic performance of a country because of the uneven distribution of the National Income. (1 x 1 = 1 mk)
5. Delivery Note accompanies goods being delivered and shows quantity of goods supplied. (1 x 1 = 1 mk)
6. **Objectives of Agricultural Research.**
- Improves crops and livestock production techniques.
  - Develop improved varieties and types of crops and livestock.
  - Improve pasture and fodder quantity.
  - Develop techniques for controlling diseases and pests of crops and livestock.
  - Determine suitable ecological zones for various crops. (2 mks)
7. **Factors considered when designing a crop rotation programme.**
- Climatic conditions
  - Soil conditions.
  - Market conditions and transport.
  - The farmers needs.
  - Pests and disease control.
8. **Advantage of land consolidation.**
- Proper supervision of land.
  - Economic use of time.
  - Saves on transport cost.
  - Easy to provide extension services.
  - Soil conservation and land improvement is facilitated.
  - Easy to control weeds, pests and diseases.
  - Farm mechanization is possible.
  - Construction of permanent structures e.g. fencing, buildings. (3 mks)
9. **Factors influencing soil erosion.**
- Slope of land.
  - Type of soil
  - Soil depth.
  - Vegetation cover.
  - Overstocking.
  - Deforestation.
  - Planting annual crop on steep slopes.
  - Indiscriminate burning of vegetation.
  - Clean weeding.
  - Ploughing up and down the slope. (2 mks)
10. **Conditions that necessitate irrigation.**
- Drought.
  - Growing of paddy rice
-

- Dry areas (1 x 2 = 2 mks)
11. **Variable inputs in a maize production enterprise.**
- Fertilizers.
  - Manure
  - Pesticide
  - Seeds
  - Casual labour
  - Herbicides. (2 mks)
12. **Factors affecting quality of hay.**
- Type of grass
  - Stage of growth at harvesting.
  - Speed of drying.
  - Addition of additives.
  - Amount of foreign materials
  - Method of storage
  - Weather condition. (1 x 3 = 3 mks)
13. **Reasons why legumes are included when establishing forage.**
- Fix nitrogen.
  - Increase protein content
  - Make the forage more palatable. (1 mk)
14. **Advantage of tillage.**
- It is cheap.
  - Opens up soil allowing water infiltration is aeration.
  - During tillage earthing up done to cover crop roots
  - Creep residue is incorporated into the soil (1 x 2 = 2)
15. **Environmental factors affecting the effectiveness of herbicide.**
- Wind
  - Rainfall
  - Soil
  - Light
  - Temperature
- SECTION B (20 marks)**
16. (a) Granular soil structure. (½ mk)  
 (b) Parts Q - Sand grain (1 mk)  
           R - Air space (1 mk)  
 (c) Top soil of cultivated soil(1 mk)  
       Sub-soil under grass/bush (1 mk)
17. (a) **Parts.**  
 M - Chlorinator  
 N - Storage tank (½ x 2 = 1 mk)
- (b) **Functions of;**  
 P - Distributes water to consumers.  
 S - Control movement of water i.e. water seeps slowly leaving all solid particles. (½ x 2 = 1 mk)
- (c) At M water is added chlorine solution depending on volume of treated water and incidences of outbreak of water borne diseases.  
 Chlorine kills micro-organisms. Water leaves this stage of treatment when clean. (1 x 2 = 2 mks)
- 18.
- (a) Pinching out method. (½ mk)
  - (b) to limit upward growth / vertical growth.  
 Encourage production of quality products. (1 mk)
  - (c) Tomatoes  
 Tobacco (1 x 2 = 1 mk)
  - (d) coppicing  
 Annual pruning (1 x 2 = 1 mk)
- 19.
- (a) **Factors considered when choosing planting time.**
  - Prevalence of pests and diseases.
  - Market demand.
  - Weather conditions at harvesting time.

- Onset of rains.
  - Soil moisture content. ( 2 mks)
- (b)
- Maximum use of rain.
  - Early harvesting.
  - Utilization of Nitrogen Flush.
  - Reduces incidences of labour competition.
  - Plants resist disease and pest attack / build up.
  - Plants compete favourably with weeds for nutrients. (1 x 2 = 2 mks)
- (c)
- Priority is given to some crops at the expense of others.
  - Inefficiency inland preparation.
  - Produce is liable to theft.
  - Income the rains delay the seeds fail to germinate.
  - Produce liable to pest attack (1 x 2 = 2 mks)

**SECTION C (40 MKS)**

20. (a)
- Extension and training - giving informal education to the farmers on production techniques.
  - Banking - a farmer should operate either a current or a saving account.
  - Credit - borrowing of capital to avoid its limitations.
  - Artificial insemination (A.I) - Use of semen obtained from high quality bulls which have been selected.
  - Agricultural Research - Improvement of crops and livestock production techniques, new varieties of breed etc
  - Marketing - Some organizations / marketing organizations help farmers to carry out marketing functions.
  - Veterinary - Veterinary officers help farmers in treating and controlling disease and parasites in livestock.
  - Farm input supply - Farmers obtain farm inputs from organizations such as co-operatives societies, private companies on individuals stores.
  - Tractor Hire Services - Provision of tractors and other machinery by the government for hire by farmers at subsidized rates. (2 x 5 = 10 mks)
- (b) (i) Farm budgeting is the process of estimating the future income and expenses of a proposed farm plan.  
(ii) Partial budget. (1 mk)

(c) Complete budget Partial Budget (1 mk)

| Complete budget         |        | Partial Budget |  | Complete budget          |        | Partial Budget |  |
|-------------------------|--------|----------------|--|--------------------------|--------|----------------|--|
| Debit(-) ✓ <sup>1</sup> | ksh    |                |  | Credit (+)✓ <sup>1</sup> | ksh.   |                |  |
| <u>Extra cost</u>       |        |                |  | <u>Cost saved</u>        |        |                |  |
| Land preparation        | 500    | ✓ <sup>1</sup> |  | Cost of cow              | 15,000 | ✓ <sup>1</sup> |  |
| Planting                | 800    | ✓ <sup>1</sup> |  | 800 Fencing              | 3,000  | ✓ <sup>1</sup> |  |
| Seeds                   | 500    | ✓ <sup>1</sup> |  | Disease control          | 1,000  | ✓ <sup>1</sup> |  |
| Fertilizers             | 1,500  | ✓ <sup>1</sup> |  | Milk man wages           | 5,000  | ✓ <sup>1</sup> |  |
| Disease & Pest control  | 1,200  | ✓ <sup>1</sup> |  | Spraying cost            | 500    |                |  |
| Harvesting              | 1,100  | ✓ <sup>1</sup> |  |                          |        |                |  |
| Total                   | 5,700  | ✓ <sup>1</sup> |  |                          | 24,500 |                |  |
| <u>Revenue Foregone</u> |        |                |  | <u>Extra Revenue</u>     |        |                |  |
| Milk sale               | 25,000 | ✓ <sup>1</sup> |  | Crop sale                | 23,000 |                |  |
| Calf sale               | 4,000  | ✓ <sup>1</sup> |  |                          |        |                |  |
|                         | 29,000 |                |  |                          |        |                |  |
| Total Debit             | 34,700 |                |  | Total Credit             | 47,500 |                |  |
|                         | 12,800 | ✓ <sup>1</sup> |  |                          |        |                |  |
|                         | 47,500 |                |  |                          | 47,500 |                |  |

(Extra Revenue + Cost saved - Extra cost + Revenue Foregone)

$$47,500 - 34,700 = 12,800$$

*The charge is worth while*

*Debit (-) @ ½*

*Credit (+) @ ½*

*Each correct entry @ ½*

*The balance 12,800*



## 21 (a) Methods of drainage.

- Open ditch method - Ditches are dug and water flows by gravity to definite water ways.
- French drains - Ditches are dug and filled with stones and gravel to enable water way.
- Cambered bed - Raised beds combined with ditches are constructed on poorly drained soils.
- Raised beds are planted with crops while ditches drain away excess water.
- Planting trees - Trees loose a lot of water in water logged areas.
- Pumping - In low lying areas water is pumped out of soil.
- Use of underground drains pipes - Pipes are perforated and laid underground to allow water from the surrounding area to drain into the pipe hence to a natural water way. (5 x 2 = 10 mks)

## (b) Factors influencing the efficiency of pesticides.

- Persistence of pesticides - Pesticides with a long residue affected retains their concentration power for long and are more effective.
- Concentration - Pesticides are more effective when applied in correct concentration.
- Weather condition - Pesticides should be applied when there is no likelihood of rain; else may lead to diluting the pesticide.
- Timing of application - Pesticides should be applied when pest is most vulnerable e.g. larval/nymph stage of development.
- Pest resistance - Pest develop resistance to certain pesticide there by reducing their efficiency.

(5 x 2 = 10 mks)

22. (a) **Production of Napier grass.**(i) **Seedbed preparation.**

- Practice early seedbed preparation during the dry period.
- Clear all the vegetation / stumps.
- Carry out primary tillage.
- Seedbed should have a medium tilth.
- Prepare furrow / holes for planting.
- Prepare furrow / holes for planting.
- Spacing between furrows 90 x 100 cm for cuttings / 90 cm x 50 cm for splits. (4 x 1 = 4 mks)

(ii) **Planting.**

- Plant at the onset of rains early / planting.
- Select desirable Napier grass variety for the ecology of the area.
- Use healthy planting materials.
- Use cutting / canes or splits for planting.
- Cuttings / canes should have 3 - 5 nodes.
- Select cutting from mature canes / stems.
- Place planting materials in the furrows / holes.
- Cover the material with soil to appropriate depth.

(5 x 1 = 5 mks)

(iii) **Fertiliser application.**

- Apply phosphatic fertiliser at planting.
- Apply farmyard manure / compost manure before planting at the rate of 7 - 10 tons / ha.
- Apply organic manure after harvesting and dig it into the soil every year.
- Top dress with Nitrogen and Potassium 6 - 8 weeks after planting. (any 3 x 1 = 3 mks)

(iv) **Weed control**

- Control weeds by cultivation, uprooting, slashing selective herbicides.
- Intercrop with legumes that smother the weeds.
- Practice timely weed control

(3 x 1 = 3 mks)

(v) **Utilisation.**

- Cut and feed it to ruminants.
- Defoliate / cut at the right, stage of growth / 3 - 5 months old.
- Cut the stem at 2.5 - 5 cm above the ground surface.
- Use sharp panga for cutting.
- Conserve excess as silage.
- Chop Napier grass into small pieces before feeding.
- Napier grass can be dried and used as mulch.

(5 x 1 = 5 mks)

**KAHURO/KIHARU DISTRICT JOINT EXAMINATION – 2015****443/2****AGRICULTURE PAPER 2****MARKING SCHEME****SECTION A**

1.
  - Require a high capital investment than other livestock enterprises.
  - Require high labour requirements.
  - Lack a reliable market.
  - Involves many risks.
  - Parasite and diseases incidences.
  - Aridity leading to poor pastures.
  - Lack of skills. (2 mks)
2.
  - Replace blade when worn out.
  - Tighten loose screws / nut.
  - Hang the saw properly after work to prevent damage.
  - Apply oil when storing for long to prevent rusting.
  - Regular cleaning.
  - Replacement / repair broken handles. (2 mks)
3. Use of hot iron rod. (1 mk)  
Use of caustic potash stick (1 mk)
4. Line breeding is mating a distantly related animals e.g. cousin to cousin / grandson to granddaughter. (1 mk)
5.
  - Freezing
  - Salting
  - Sunning / sun drying
  - Smoking
  - Deep flying (2 mks)
6.
  - Grain and cereals and their by products.
  - Roots of e.g. sweet potato and cassava.
  - Tubers e.g. Irish potato.
  - Molasses - a by product of sugarcane
  - Pasture e.g. grasses and legumes (2 mks)
7. The cut slices will be thrown further away from the furrow made by the plough. (1 x 1 = 1 mk)
8.
  - Mouth
  - Nose
  - Skin if ruptured
  - Genital organs
  - Eyes
  - Ears
  - Umbilical cord in young animals.
  - Anus (2 mks)
9.
  - Boiled milk properly before drinking.
  - Use of gloves when handling aborted foetus, birth membrane.
  - Proper cooking of meat before eating. (1 x 3 = 3 mks)
10.
  - Know amount of food eaten by each animal.
  - Compare feeding with production.
  - Know the amount of food in the store.
  - Enable the farmer to plan.
  - Monitor appetite of each animal. (1 x 3 = 3 mks)
- 11.

- 
- Calf takes milk at body temperature.
  - Milk is free from contamination.
  - It prevents scouring in calves.
  - Milk is provided in adlibitum.
  - Low labour requirements. (2 mks)
- 12.
- Size / weight of the animal.
  - Age of the animal.
  - Animal activities.
  - Level of production. (2 mks)
13. Sporocyst  
Caercaria  
Rediae (1 mk)
- 14.
- Contains antibodies to protect young ones against infections.
  - Easy to digest.
  - Highly nutritious
  - Has a laxative effect. (2 mks)
- 15.
- Gear box
  - Differential.
  - Final drive
  - Clutch assembly (2 mks)
- 16.
- Taking the cow into a milk shed.
  - Sight / or smell of food in the feed trough.
  - Rattling sound of milking bucket.
  - Sight of milk person.
  - Massaging or washing the cows udder with warm water.
  - Sight of calf for cows inclined to suckling calves.
  - Suckling by the calf. (2 mks)
- SECTION B**
- 17.(a) Q - Residue  
R - Liquid mixture (1 mks)
- (b) S - holds honey combs and strains honey into the basin. (1 x 1 = 1 mk)
- (c) Bee brush  
Hive tool  
Protective gear  
Honey container (2 mks)
18. (a) Ear notching. (1 mk)
- (b) Ear notcher / ear notch punch. (1 mk)
- (c) The notches should not be too small as they may close up, should not also be too large they may deform the ear. (1 x 1 = 1 mk)
- (d) Pigs  
Goats  
Sheep  
Cattle (2 mks)
19. (a) Lack of vitamin B<sub>2</sub> (riboflavin) (1 x 1 = 1mk)
- (b) Poor/retarded growth.  
Nervous disorder  
Chick walk on hocks. (1 x 2 = 2 mks)
- (c)
- Sources of vitamin B<sub>2</sub>
  - Hay
  - Skimmed milk

- Liver
  - Green forage
  - Yeast (2 mks)
20. (a)
- Animals are harnessed either in pairs or singly.
  - A yoke is made to enable it rest on the animals neck.
  - Yoke is held into position by a rope and wooden brackets.
  - A cart is harnessed into the yoke. (3 mks)
- (b)
- Health.
  - Proper feeding
  - Size, age, body weight
  - Proper training
  - Tidiness of operation. (1 x 2 = 2 mks)
- 21.
- (a) Reasons for feeding animals on a balanced ration. (6mks)
- Reduce cost of treatment.
  - Promote market value of product / by-product.
  - Fast growth rate.
  - Promote good health.
  - Promote reproduction - breed regularly.
  - Maintain animals body weight.
  - Promote resistance against disease attack.
  - Obtain high yields.
  - Improve / promote prolificacy. (6 x 1 = 6 mks)
- (b) Preparation and management of natural incubation.
- Ensure the hen is completely broody.
  - Make / provide a spacious nesting box for ease of movement.
  - Ensure the nesting box is dark inside to discourage cannibalism and egg eating.
  - Place nesting box in a well veneration place.
  - Provide adequate number of eggs depending on body size of hen, preferably in the evening.
  - Provide bird with balance food and clean water.
  - Allow the bird to move out occasionally to exercise.
  - Dust the bird to control external parasites.
  - Ensure eggs are not interfered with by bunching or turning. (9 x 1 = 9 mks)
- (c) Characteristics of beef cattle.
- Well fleshed bodies.
  - Blocky shape.
  - Short strong legs.
  - Early maturing.
  - Efficient converters of food into meat and fat.
  - Good foragers.
  - Resistance to tropical diseases.
  - Tolerance to high temperature.
  - Ability to maintain weight during adverse conditions.
  - Regular breeders. (5 x 1 = 5 mks)
- 22.
- (a) Advantages of farm mechanisation.
- Farm operations can be achieved on time.
  - Large area can be covered with a short time.
  - Reduce drudgery / makes work easy and enjoyable.
  - High yields are obtained because farm operations are carried out on time.
  - Pest and disease outbreak can be controlled relatively in the shorter time.
  - Tends to encourage farmers to consolidate their land.
  - Farmers benefit from economies of scale.

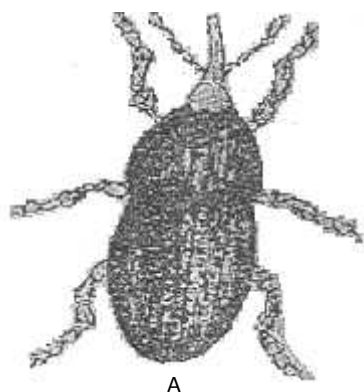
- 
- Use less labour. (5 x 1 = 5 mks)
  - (b) maintenance practices of tractor battery.
    - Keep electrolyte level above place.
    - Clean / scrub corroded terminals.
    - Change regularly.
    - Fix the battery tightly in a box. (4 x 1 = 4 mks)
  - (c) Parts of a disc plough.
    - Beam - provide attachment for all other parts.
    - Disc - cut, turn and invert furrow slice.
    - Scrappers - removes wet soil from disc aid in turning and inverting furrow slices.
    - Standard - Connects disc to plough beam facilitates movement of disc due to presence of hubs.
    - Furrow wheel - rides over dead furrow contracting thrust created by disc thus balance the implement.
    - Adjust depth of ploughing. (5 mks)
  - (d) Disadvantages of animal drawn implement over tract drawn implements.
    - More tedious.
    - Requires more labour.
    - Time consuming.
    - Animal get tired.
    - Animals attacked by diseases.
    - Animals require extra land for grazing. (6 x 1 = 6 mks)
- 23.
- (a) Factors to consider when siting a calf pen.
    - Drainage.
    - Safety / security
    - Proximity to the dairy shed.
    - Topography (3 x 1 = 3 mks)
  - (b) Features of an ideal calf pen
    - Concrete / raised floor - easy to maintain cleanliness.
    - Dry litter / bedding - maintain warmth.
    - Proper lighting - should have good supply of natural light / sunlight.
    - Proper drainage - facilitate free flow of urine and water to avoid dampness.
    - Draught free - The structure should stop string winds from blowing into the calf pen.
    - Proper ventilation - should allow for fresh air circulation.
    - Security - should be strong enough to keep away intruders / wild animals. (7 x 1 = 7 mks)
  - (c) Factors considered when selecting materials for constructing a dairy shed.
    - Cost of material to be used.
    - Availability of required skills / labour
    - Availability of capital for the kind of material required.
    - Environmental conditions such as presence of pests, soil type, climate.
    - Durability / quality / strength of material.
    - Type of dairy shed whether temporary or permanent.
    - Suitability of the materials to the animals e.g. use of non toxic painting.
    - Workability / applicability of the materials.
    - Farmer's taste and preferences. (any 10 x 1 = 10 mks)

**CENTRAL KENYA NATIONAL SCHOOLS JOINT MOCK - 2015***Kenya Certificate of Secondary Education***443/1****AGRICULTURE****PAPER 1****JULY/AUGUST, 2015****SECTION A: (30 MARKS)***Answer all questions in this section in the spaces provided.*

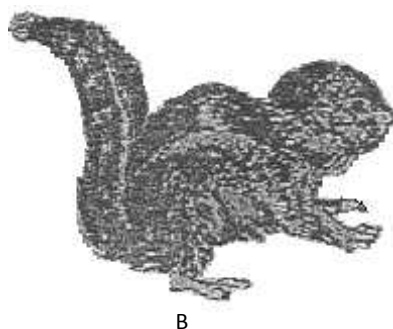
1. Agriculture is viewed as an Art and a Science. State **four** practice in the farm that makes Agriculture an Art. (2 marks)
2. State **four** ways in which a farmer can improve the structure of a water logged clay soil. (2 marks)
3. Despite efficient water supply to his tomatoes, Mr. Gikandi still noted wilting of some plants. Suggest **two** possible causes of this wilting. (1 mark)
4. Outline the stages undergone in the development of a gully. (2 marks)
5. (a) Explain why zone 2 in the zones of production is called a Rational Zone. (1 mark)
- (b) Differentiate between a complete budget and a partial budget. (1 mark)
6. (a) State **four** deficiency symptoms that would be seen in crop lacking potassium. (2 marks)
- (b) A farmer was advised to apply 150kg of CAN of maize. Calculate the amount of Nitrogen applied per Hectare if CAN contains 21%N. (1 mark)
7. List down **three** types of Nurseries. (1½ marks)
8. State **four** achievements that can be made with high level of education and technology in agriculture. (2 marks)
9. Name **four** examples of liabilities in a balance sheet. (2 marks)
10. State **four** ways in which a farmer can increase labour productivity in the farm. (2 marks)
11. Give **four** farming practices that may help in achieving minimum tillage. (4 marks)
12. State **four** reasons why timely weed control is advisable in cop production. (2 marks)
13. Give **two** forms of collective land tenure system in Kenya. (1 mark)
14. Define the term "Economic Injury Level" of a crop. (1 mark)
15. State **three** characteristics of shifting cultivation. (1½ marks)
16. Name the disease that is characterized by mass of dark spores on the flowering part of maize.

**SECTION B: (20 MARKS)***Answer all the questions in this section in the spaces provided.*

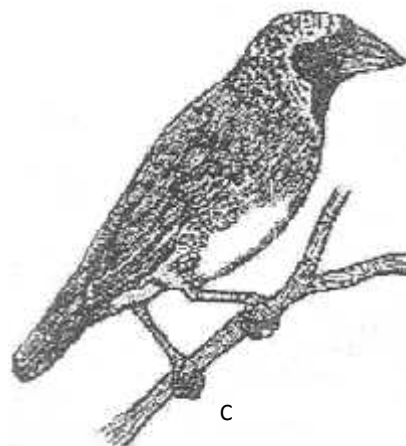
17. Three maize pests are shown in the diagram below. Study them and answer the questions that follow.



A



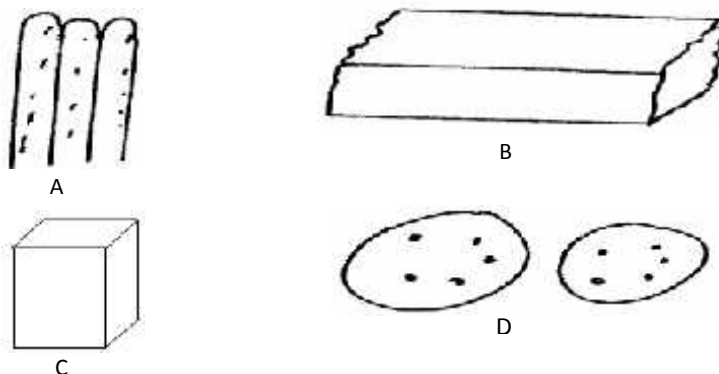
B



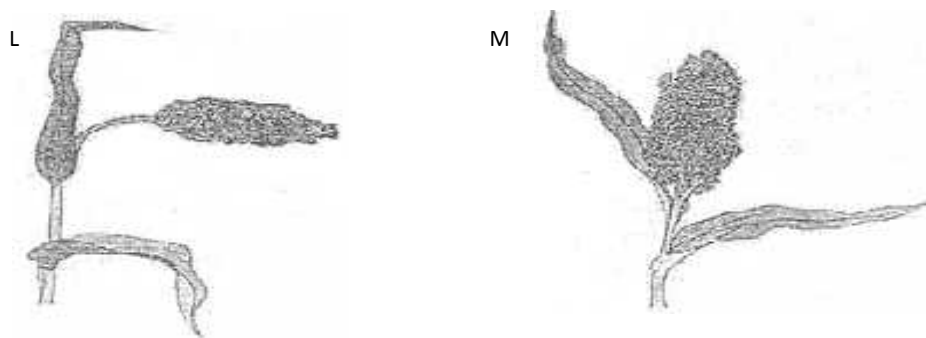
C

- (a) Identify the pests in the diagrams labeled **A**, **B** and **C**. (2 marks)
- (b) At what stage of maize production does pest **A** and **B** damage the crop? (2 marks)
- (c) Give **two** ways in which **C** causes loses in field crops. (2 marks)

18. Study the following types of soil structures and answer the questions that follow.



- (a) Identify the type of soil structure labeled. (2 marks)  
 (b) Which type of soil structure is best suited for farming. (1 mark)  
 (c) Identify **four** characteristics which make the soil structure named in (b) above suitable for farming. (2 marks)
19. The diagram below shows panicles of two sorghum varieties. Study the diagrams and answer the questions that follow.



- (a) Identify varieties **L** and **M**. (2 marks)  
 (b) Which of the two varieties of sorghum is less likely to be damaged by birds? (1 mark)  
 (c) Give a reason for your answer in (b) above. (1 mark)
20. Differentiate between a Hybrid and a composite as applied in maize production. (1 mark)
21. Why are the following weeds difficult to control? (1 mark)
- (a) Couch grass. (1 mark)  
 (b) Oxalis latifolia. (1 mark)  
 (c) Double thorn. (1 mark)

### **SECTION C: (40 MARKS)**

Answer any two questions in this section in the spaces provided after question 24.

22. (i) Explain **five** structural structures used to control soil erosion. (10 marks)  
 (ii) State and explain **five** factors which may influence the spacing of crops. (10 marks)
23. (a) Describe **ten** cultural methods used in controlling crops pests. (10 marks)  
 (b) Describe production of paddy rice under the following sub headings:
- (i) Land preparation. (3 marks)  
 (ii) Water control. (3 marks)  
 (iii) Role of irrigation water. (3 marks)  
 (iv) Signs of maturity. (1 mark)

24. Using the data below answer the questions that follow.

- (a) Work out the Marginal revenue, Marginal cost and Net revenue at all levels of production and complete the table. (7 marks)

| Fertilizer input (Bags) | Maize output (Bags) | Total Revenue Kshs. | Total Cost Kshs. | Marginal Revenue Kshs. | Marginal Cost Kshs. | Net Revenue Kshs. |
|-------------------------|---------------------|---------------------|------------------|------------------------|---------------------|-------------------|
| 0                       | 0                   | 0                   | 0                | 0                      | 0                   | 0                 |
| 2                       | 14                  | 28000               | 5600             | -                      | -                   | -                 |
| 4                       | 39                  | 78000               | 11200            | -                      | -                   | -                 |
| 6                       | 61                  | 122000              | 16800            | -                      | -                   | -                 |
| 8                       | 78                  | 156000              | 22400            | -                      | -                   | -                 |
| 10                      | 87                  | 174000              | 28000            | -                      | -                   | -                 |
| 12                      | 88                  | 176000              | 23600            | -                      | -                   | -                 |

- (b) On the graph paper provided, draw a graph of output against input. (4 marks)
- (c) From the graph, work out the maize output at the input levels 3 and 9. (2 marks)
- (d) State the level of input where maximum profit is realized and give a reason. (2 marks)
- (e) What is elasticity of demand? (Ed) (1 mark)
- (f) Enumerate the factors that determine the elasticity of demand. (4 marks)

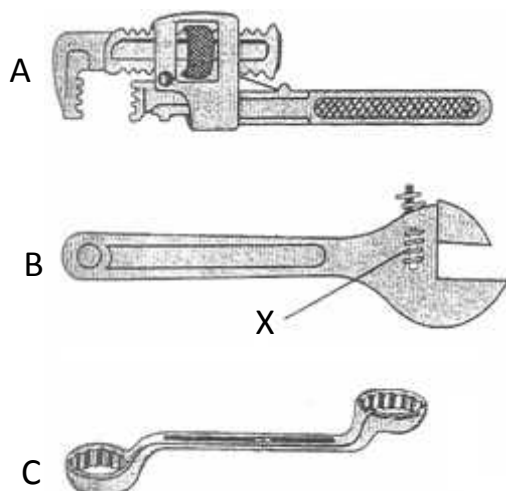


**CENTRAL KENYA NATIONAL SCHOOLS JOINT MOCK - 2015***Kenya Certificate of Secondary Education***443/2****AGRICULTURE****PAPER 2****JULY/AUGUST, 2015****SECTION A: (30 MARKS)***Answer all questions in this section in the spaces provided.*

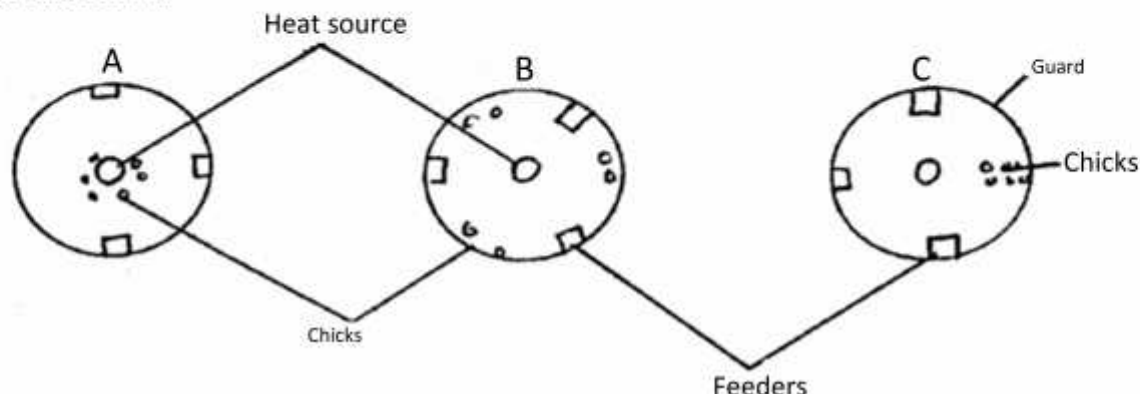
1. State the major physical difference between a Landrace and a Large White Pig. (2 marks)
2. (a) Name **two** livestock diseases that are controlled through use of same vaccine. (2 marks)  
(b) Name the vaccine as in 2 (a) above. (½ mark)
3. Name **two** diseases that attack bees. (2 marks)
4. State **two** distinguishing external characteristics of Californian White Rabbit. (2 marks)
5. State the functions of the following hormones in livestock.  
(a) Oxytocin. (1 mark)  
(b) Stilboesterol. (1 mark)
6. Name **four** species of fresh water fish reared in Kenya. (2 marks)
7. Give **three** methods of feeding colostrums to a Newly Born Calf. (1½ marks)
8. State **four** advantages of using Kenya Top Bar Hive over Log Hive. (2 marks)
9. List **four** factors that would ensure clean milk production. (2 marks)
10. State **two** reasons for clipping the Upper Beak in poultry management. (1 mark)
11. State **two** ways of preventing predation in a fish pond. (2 marks)
12. Differentiate between crutching and ringing. (1 mark)
13. Name **two** major physical differences between Dromedary and Bacterian Breeds of camel. (2 marks)
14. State **four** major Routes of Administering vaccines in a day old chick. (2 marks)
15. State **four** measures that prevent egg eating in poultry. (2 marks)
16. Give **four** factors determining the amount of water taken by an animal. (2 marks)
17. List **two** factors considered in sorting and grading eggs for market. (2 marks)
18. List any **four** predisposing factors of livestock diseases. (2 marks)
19. (a) Define the term immunity as used in livestock health. (1 mark)  
(b) List **four** causes of livestock diseases. (2 marks)
20. Name **two** structures used in the control of ticks. (1 mark)
21. (a) State **two** possible causes of soft shelled eggs. (1 mark)  
(b) State **two** qualities of good eggs for incubation. (1 mark)

**SECTION B: (20 MARKS)***Answer all questions in this section in the spaces provided.*

22. The diagram below show some workshop tools. Study the diagrams and answer the questions that follow.



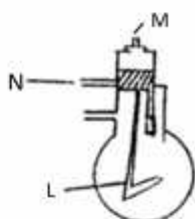
- (a) Identify tools labelled. (3 marks)  
 (b) What functional advantage does the tool labelled **B** have over tool **C**? (1 mark)  
 (c) State the function of the tool labelled **A**. (1 mark)  
 (d) State the function of part **X** in the tool labelled **B**. (1 mark)
23. Below are diagrams illustrating the behaviour of chicks in various brooders. Study the diagrams and answer the questions that follow.



- (a) State the environment problem in each brooder as illustrated by the behaviour of the chicks. (3 marks)  
 (b) State **one** way of solving the problem in B. (1 mark)
24. Study the illustration shown below and answer the questions that follow.



- (a) Name the condition shown above. (1 mark)  
 (b) What causes the condition shown in **24(a)** above? (1 mark)  
 (c) Explain the treatment of the condition named in **24(a)** above. (2 marks)
25. A farmer computed 100kg ration with 20% DCP from oats which contains 10% DCP and simsim seed cakes containing 60% DCP. Using the Pearson Square method, calculate the amount of each feedstuff in the ration. (5 marks)
26. Below is a diagram of two stroke engine cylinder.



Name **one** farm machine where the above engine is used. (1 mark)

### **SECTION C: (40 MARKS)**

*Answer any two questions in this section in the spaces provided after question 29.*

27. (a) Describe the management practices that should be carried out on a sow and piglets during the farrowing period. (12 marks)  
 (b) Explain **five** reasons why a breeding boar may be culled. (5 marks)  
 (c) State **four** maintenance practices of forked jembe. (3 marks)
28. (a) Describe how the transmission system of a tractor transmits power that is developed in a cylinder to the wheels for motion. (15 marks)  
 (b) Describe **five** long term tractor services and maintenances. (5 marks)
29. (a) State **six** features of an ideal calf pen. (6 marks)  
 (b) Describe the uses of fences in the farm. (8 marks)  
 (c) State **six** factors considered when siting farm structures. (6 marks)

**CENTRAL KENYA NATIONAL SCHOOLS JOINT MOCK - 2015****443/1****AGRICULTURE PAPER 1****MARKING SCHEME**

1.
  - Tilling of land
  - Carrying out construction
  - Harvesting of crops
  - Handling livestock
  - Operating machines
  - Marketing of farm produce. (4 x ½ = 2mks)
2.
  - Planting trees with a high water uptake.
  - Use of open ditches.
  - Underground drain pipes.
  - French drains.
  - Cambered beds.
  - Pumping (4 x ½ = 2mks)
3.
  - Attack by bacterial wilt.
  - Presence of galls on roots due to attack by Nematodes.
  - Attack by moles. (1 x 2 = 2mks)
4.
  - Rain water leaves the water sheds.
  - Flowing water forms channels.
  - Water volume increases, wearing the sides of the channels.
  - Scouring of the channel floor.
5. (a) Output is maximum / total product increases at a decreasing rate / Resources are utilized to the maximum.  
 (b) A complete budget is prepared when there is a major change in the farm business, a partial budget is prepared when there is a minor change in the farm business. (Mark as a whole) (1mk)
6. (a)
  - Leaf curling
  - Leaf chlorosis
  - Premature leaf fall
  - Stunted growth
  - Scorching of leaf edges
 (b)  $150 \Rightarrow X$   
 $100\text{kg} \Rightarrow 21\text{KgN}$   

$$X = \frac{21 \times 150}{100}$$

$$X = 31.5\text{KgN} \quad \text{(2 x ½ = 1mk)}$$
7.
  - Vegetative propagation nursery.
  - Tree nursery
  - Vegetable nursery
8.
  - Proper method and time of doing things e.g. planting, spacing.
  - Use of right type and amount of inputs.
  - Applying inputs at the right place.
  - Making right occasions based on proper observation.
9.
  - Bank loans
  - Unpaid expenses e.g. water bills.
  - Bank overdrafts.
  - Creditors.
- 10.

- Mechanization
  - Training the workers
  - Incentives / motivation to workers
  - Supervision
  - Providing better working tools.
  - Fair and prompt payment.
- 11.
  - Mulching
  - Herbicides
  - Confining cultivation to crop base
  - Uprooting of weeds
- 12.
  - To avoid competition for nutrients.
  - To prevent pest harbouring.
  - To avoid competition for sunlight / light intensity for plant use.
  - Control disease incidences.
- 13. Cooperative  
Communal
- 14. Its damage caused by pests beyond tolerance.
- 15.
  - Large piece of land.
  - Land is communally owned.
  - Low population density.
  - Having different pieces of land within a given area.
- 16. Heads smut.

### **SECTION B**

- 17. (a) A – Maize weevil  
B – Mole  
C – Weaver bird
- (b) A – Storage stage  
B – Germination stage
- (c) - Reduces yields by eating grains.  
Lowers quality by exposing grain to weather damage.  
Causes grain fall off.
- 18. (a) A – Columnar  
B – Blocky  
C – Prismatic  
D – Granular / crumb
- (b) Granular / crumb
- (c) - Good drainage
  - Stable against rain / wind
  - Retain enough water.
  - Allow good aeration / porous.
  - Allow even root development.
  - Support high populations of soil organism.
- 19. (a) L – Compact panicle sorghum  
M – Goose-necked sorghum
- (b) M – Goose-necked sorghum.
- (c) Birds find it difficult to feed on the bent panicles / birds cannot perch on it easily.
- 20. A hybrid is developed by crossing two pure varieties of maize under controlled pollinations;  
a composite is obtained by growing of several varieties of diverse genetic composition and allowing them to freely inter pollinate. (Mark as a whole) (1x1 = 1mk)
- 21. (a) Presence of underground Rhizomes.
- (b) Underground bulbs.
- (c) Presence of thorns that cause irritation.

**SECTION C**

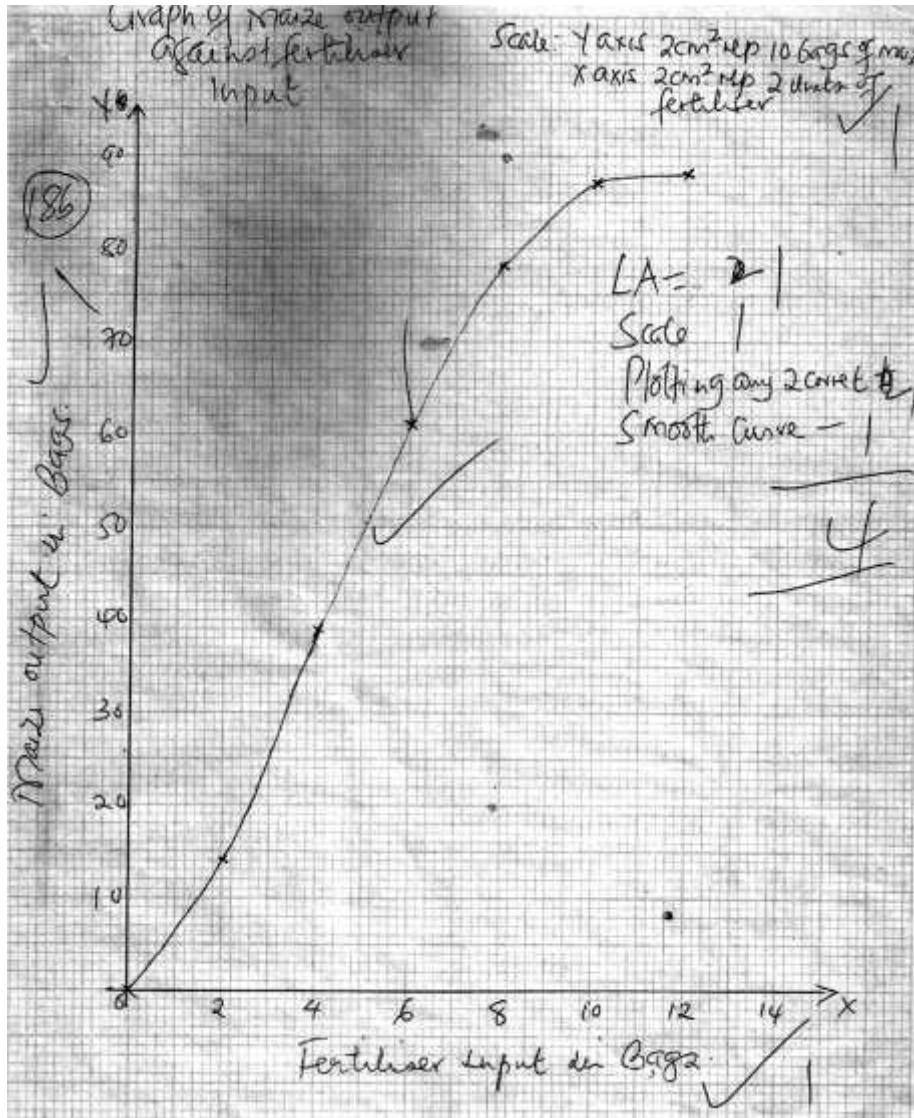
22. (i) Terraces – are man made structures constructed across a slope to reduce soil erosion.  
 Trash lines – vegetative materials arranged between rows of crops along contours to slow surface run-off and trap soil.  
 Stone lines – stones are arranged in lines across the slope to slow surface run off and trap eroded soil.  
 Bunds – made by heaping soil across the slope to form barriers that reduce soil erosion.  
 Porous dams / Gabions – constructed across a gully that allow water to filter through but traps eroded soil.
- (ii) Soil fertility – fertile soils spacing is closer while it is wider in poor soils.  
 Size of the plant – tall plants varieties require wider spacing than short varieties.  
 Moisture content – areas with adequate moisture, spacing can be narrow.  
 Mechanization – mechanized form require wider spacing to allow movement of machines.  
 Growth habits – crops that spread require wider spacing while those that do not spread require narrow spacing.  
**NB:** Stating – 1mk, Explanation – 1mk
23. (a)
- Timely planting – early planted crops escape pest attack than late planted ones.
  - Timely harvesting – enables crop to escape attack by some storage pests e.g. grain weevils.
  - Proper tillage – exposes pests which are soil borne to predators e.g. birds / scorched by sun.
  - Closed season – a period when a susceptible crop is not grown in order to control a certain pest or group of pests.
  - Trap cropping – A crop planted before or together with the main crop for attracting pests.
  - The pest is then killed by other means e.g. spraying.
  - Crop rotation – crops preferred by pests are rotated with crops not preferred. This starves the pests to death.
  - Planting resistant crop varieties – They have natural protective mechanisms against pest attack.
  - Field hygiene – keeping the field free from any plant materials harbouring pests.
  - Alteration of environmental condition – creating micro-climates that are not conducive to some pests.
  - Crop nutrition – application of fertilizers and manures makes crops to grow strong and able to resist and escape pest attack.
  - Destruction of alternative hosts – removal of weeds that act as alternate hosts to crop pests reduce pest infestation.
  - Use of clean planting materials – prevents introduction and spreading of crop pests.
  - Proper spacing – makes it difficult for pests to move from one plant to another.
  - Use of organic manure – discourages eelworms.
  - Irrigation – overhead irrigation to control aphids.
  - Chemical control – use of pesticides to alter the conditions favourable for survival of pests.
- (b) (i)
- Clear the land.
  - Flood the land four days before primary tillage to soften the soil.
  - Plough the land using a rotavator.
  - Harrow to a fine tilth.
  - Level the land.
  - Construct bunds and levees.
  - Create inlet and outlet channels.
  - Flood the field
  - Drag a leveling board to produce fine mud.
- (ii)
- Flood 7.5 - 10cm above the soil surface.
  - Leave the field flooded for 4 days before primary ploughing.
  - Increase water gradient with increased height.
  - Carry out weeding and repair dykes to reduce water loss.
  - Ensure water flows slowly in the field.
  - Change water after every 2-3 weeks.
  - Drain the field 2 – 3 weeks before harvesting.
- (iii)
- Regulate water temperature.
  - Highly toxic substances are leached.

24. (a)

| Marginal Revenue | Marginal cost | Net revenue |
|------------------|---------------|-------------|
| 28,000           | 5,600         | 22,400      |
| 50,000           | 5,600         | 103,200     |
| 34,000           | 5,600         | 13,600      |
| 18,000           | 5,600         | 144,000     |
| 2,000            | 5,600         |             |

4 x 1/2 = 7 marks)

(b) (i) - On graph paper



(c) Level 3 – 26 bags

Level 9 – 83 bags

(2x1 = 2mks)

(d) Level – 10 units of fertilizer (input)

Reason – Highest net revenue

(2x1 = 2mks)

(e) It is the degree of responsiveness of demand to price changes.

(1 x 1 = 1mk)

(f)

(g)

- Availability of substitute commodity.
- Degree of necessity
- Number of users
- Time lag
- Time span
- Promotion / Advertisements

(4x1 = 4mks)

**CENTRAL KENYA NATIONAL SCHOOLS JOINT MOCK - 2015****443/2****AGRICULTURE PAPER 2****MARKING SCHEME**

- |  |  |                       |
|--|--|-----------------------|
| 1. <u>Landrace</u><br>– Has straight snout<br>– Drooping ears  | Large white<br>Broad slightly dished snout<br>Erect ears | (2mks)                |
| 2. (a) Blackquarter / Blackleg<br>(b) Blanthrax  |  | (½mk)<br>(2mks)       |
| 3. (a) Acarive<br>(b) American fowl brood  |  | (2mks)                |
| 4. California<br>White with black parts on the body, ears, nose, paws and tails.   |  | (2mks)                |
| 5. (a) Oxytoxin – Brings about milk let down.<br>(c) Stilboestral – For caponization.  |  | (1mk)<br>(1mk)        |
| 6. Nile perch<br>Trout<br>Tilapia<br>Catfish / mud fish  |  | (2mks)                |
| 7.<br>– Bucket feeding<br>– Natural feeding<br>– Bottle feeding  |  | (1½mks)               |
| 8.<br>– Easy to harvest.<br>– Honey is free from contamination.<br>– Top bars can be removed to inspect combs and be replaced without problems.<br>– Cheap to construct.   |  | (2mks)                |
| 9.<br>– Clean milkman<br>– Clean milking herd<br>– Healthy milking herd  |  | (2 x ½)               |
| 10.<br>– Avoid cannibalism<br>– Avoid egg-eating<br>– Avoid toe pecking<br>– Avoid feather plucking  |  |                       |
| 11.<br>– Fencing around the pond.<br>– Putting up a net above the pond.  |  | (1x1)                 |
| 12.<br>– Crutching - cutting of wool around the vulva the vulva of ewe to facilitate mating.<br>– Ringing is cutting wool around the sheath of a ram to facilitate mating. |  | (1mk) (mark as whole) |
| 13. - Bacterian<br>- 2 humps<br>- more fur   | - Promedary<br>- 1 hump<br>- less fur                    |                       |
| 14.<br>– Orally<br>– Cloaca<br>– Inhalation<br>– Injection   |  |                       |
| 15.<br>– Proper feeding<br>– Debeaking<br>– Feeding birds with oyster shells.  |  |                       |

- Dim light in laying boxes.
  - Hanging green vegetable material.
  - Scattering grains on the floor.
  - Enough laying boxes.
- 16.
- Types of feed
  - Size of the animal
  - Age of the animal
  - Species of animal
  - Breed of animal
  - Level of production
  - Ambient temperatures
17. - Cleanliness
- Size
  - Colour
  - Candling quality
18. - Species of animal
- Age
  - Colour
  - Breed of animal
  - Size of herd
19. (a) Ability of an animal to resist disease. (1mk)
- (b)
- Nutritional causes
  - Physical causes
  - Chemical causes
  - Living organisms
- 20.
- Plunge dip / Machakos dip
  - Crush
  - Spray race
21. (a) - Lack of calcium carbonate
- New cattle disease
- (b) - Fertile
- No cracks
  - Medium size
  - Oval in shape
  - No double York
  - No blood stain
  - No meat spots

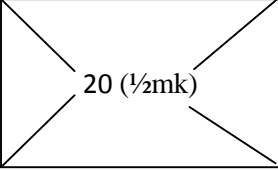
### **SECTION B**

22. (a)
- A – Pipe wrench
  - B – Adjustable spanner
  - C – Ring spanner
- (b) B can be used on nuts and bolts of different sizes (reject any size) while a can only used only on specific size.
- (d) Holding pipes or loosening them during plumbing.
- (e) Opening or closing the jaws to enable it open or tighten nuts of different sizes.
23. (a) A – Too cold / low heat.
- B – Too hot
  - C – Draught (Rej. drought)
- (d) Reduce the number of heat sources.
- Use of low voltage bulbs.
  - Lowering the wick if lanterns are used.



24. (a) Milk fever  
 (b) Low calcium level in the blood.  
 (c) Intravenous injection; with calcium and bolglucomate.

25.

|                              |   |  |
|------------------------------|---|--|
| Oats 10 DCP<br>(½mk)         |  | 40 parts<br>(½mk)  |
| Simsim (½mk) 60%<br>Cake DCP |   | $\frac{10 \text{ parts}}{50 \text{ parts}} \quad (\frac{1}{2}\text{mk})$ |

Oats =  $\frac{40}{50} \times 100 \text{ (½mk)} = 80\text{kgs (½mk)}$

Simsim =  $\frac{10}{50} \times 100 \text{ (½mk)} = 20\text{kgs (½mk)}$

26. Lawn mowers e.g. mowers

Chain saws  
 Water pumps

**SECTION C**

27. (a)
- Clean and disinfect the following pen.
  - Wash / clean and disinfect the sow.
  - Control external parasites.
  - Move sow to farrowing pen (3 days before farrowing)
  - Provide a creep area.
  - Provide cleaning beddings for the sow.
  - Provide bran to sow after farrowing.
  - Ensure piglets are suckling.
  - Ensure piglets are breathing.
  - Weigh the piglets.
  - Dispose after birth.
  - Dispose off born still piglets. (1x12)
- (b)
- Old age – cull the old
  - Health of boar – cull frequently sick.
  - Injury – cull seriously injured and unable to mate.
  - Inbreeding – cull when daughters are used as replacement stock.
  - Size – cull when too heavy to mate.
  - Fertility – cull the infertile boars (1 x 5)
- (c)
- Clean after use
  - Straighten bent pongs
  - Tighten loose handle
  - Replace broken handle (1x3)
28. (a) **THE CLUTCH**
- It connects and disconnects the drive shaft to or from the engine.
  - Facilitates smooth and gradual take off.
  - Provide power from engine or P.T.O.
- THE GEAR BOX**
- Select forward or reverse gear.
  - Adjust speed of drive from engine to be applied appropriately.
  - To stop the vehicle without stopping the engine.
- THE DIFFERENTIAL**
- Change the direction of drive.
  - Moderation motion speed as opposed to engine speed.

- Enables rear wheels to rotate independently.

**FINAL DRIVE**

- Move the vehicle forward and backward.
- Absorbs shock since wheels are inflated.

(5x1)

(b)

- Inspect steering and gear box oil and top up if necessary.
- Change engine oil by complete draining and replace with fresh oil.
- Check differential oil – top up when necessary.
- Replace or dust off air cleaner when necessary.
- Check oil in the air cleaner and change if it is dirty
- Remove large sediments from sediment tool.

29. (a)

- Well ventilated
- Leak proof roof.
- Well lit
- Drought free
- Well drained floor
- Spacious
- Easy to clean
- Strong enough

(6x1)

(b)

- Provide security against thieves and predators.
- Enables paddocking / rotational greasing / mixed farming.
- Controls parasites and diseases by keeping away foreign animals.
- Shows boundaries between farms
- Acts as wind breakers.
- Improves aesthetic values.
- Helps to conserve soil and water.
- Some Hedgers are used as livestock fodder / fruits / firewood provider / privacy.
- Enables isolation of animals for different purposes.

(8x1)

(c)

- Prevailing direction of wind.
- Soil type
- Security of structure
- Accessibility
- Locomotion in relation to existing structure
- Topography / drainage of area
- Local government regulation / Government policy
- Purpose of structure
- Space availability for future expansion.
- Direction / position of sun.
- Nearness to social amenities – roads
- Farmers' tastes and preferences.

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**AGRICULTURE****FORM 4****TIME: 2 HOURS**

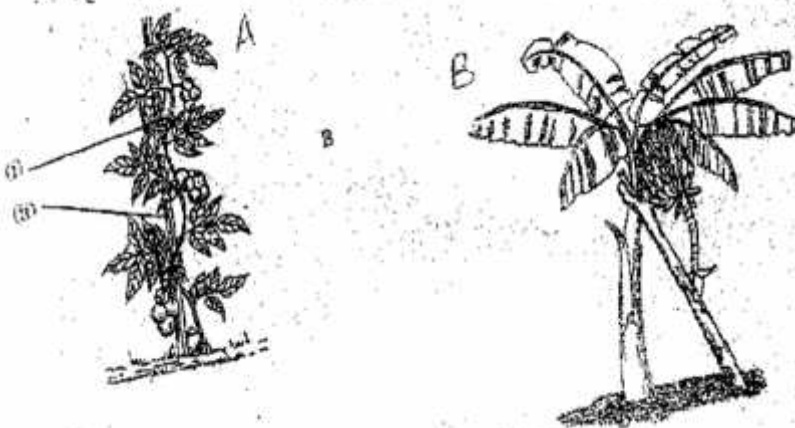
1. List **two** aspects of light that influence agriculture (1mk)
2. State **two** reasons why land settlements were established in Kenya (1mk)
3. Outline **two** methods used by farmers to harden-off seedlings in the nursery (1mk)
4. State **four** advantages of overhead irrigation (2mks)
5. State what is meant by the term "trap crop" as used in crop pest control (1mk)
6. Give **three** reasons for practising minimum tillage (1 ½ mks)
7. Name **two** insect pests that attack sorghum in the field (1mk)
8. State **two** conditions when opportunity costs are zero (1mk)
9. (a) .State **three** reasons for practising grafting in citrus production (1 ½ mks)
- (b) Give the method used in breaking seed dormancy in the following crops
  - (i) Calliandra (½mks)
  - (ii) Rice (½mks)
10. State **two** advantages of mixed pastures (1mk)
11. State **four** principles of co-operative societies in Kenya (2mks)
12. List **three** types of production functions (1½mks)
13. State **four** properties of soil that are influenced by its texture (2mks)
14. Outline **four** agricultural support services available to a livestock farmer (2mks)
15. Give **four** factors which influence solifluction (2mks)
16. List **four** factors that affect the selectivity of herbicides (2mks)
17. Give **two** types of product- product relationship in agriculture economics (1mk)
18. Outline the advantages of using certified seed in crop production (1 ½ mk)
19. Give **two** ways of utilizing napier grass as a forage crop (1mk)
20. Explain the following terms
  - (i) Elasticity of demand (1mk)
  - (ii) Elasticity of supply (1mk)

**SECTION B ( 20 MARKS )****Answer all questions in the space provided**

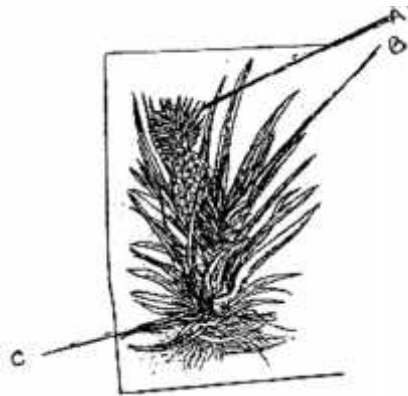
21. Below are diagrams of some storage pests. Use them to answer the questions that follows



- (a) Identify the pest labelled X , Y and Z (3mks)
  - (b) State **two** groups of pests based on their mode of feeding (2mks)
22. Use the illustration below to answer the questions that follow



- (a) Identify the practice illustrated in diagram A and B (2mks)  
 (b) Give **three** reasons for carrying out the practice illustrated by A (3mks)
23. Use the diagram below to answer the questions that follows



- (a) Give the identity of the following parts (3mks)  
 (b) Give **two** ecological factors that influence the sweetness of the above fruit (1mk)  
 (c) Which of the parts labelled A, B and C is the best for propagation? Give a reason (1mk)
24. Use the diagrams below of weeds to answer the questions that follow



- (a) Identify weed P and Q (2mks)  
 (b) State **one** harmful effect in each case that is specific to each of the weeds P and Q to a farmer (2mks)  
 (c) Which is the most effective way of controlling weed Q (1mk)

### **SECTION C (40marks)**

**Answer any two questions from this Section in the spaces provided after question 27**

- 25 (a) Explain various practices carried out in the field to control crop diseases (10mks)  
 (b) Describe the steps followed when making silage (10mks)
26. (a) Explain **five** factors to consider in choosing the type of irrigation in the farm (10mks)  
 (b) State factors a farmer should consider before deciding to use chemical as a pest control method (5mks)  
 (c) Explain reasons for land fragmentation (5mks)
27. (a) Outline **ten** marketing functions (10mks)  
 (b) Explain why timely weed control is advisable in crop production (5mks)  
 (c) Give reasons for pruning coffee (5mks)

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AGRICULTURE

PAPER 2

TIME: 2 HOURS

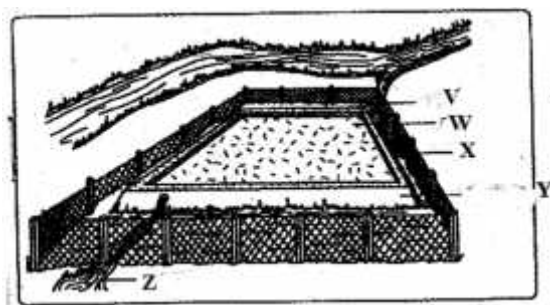
**Answer all questions in the spaces provided - section A**

1. Define the term caponization in poultry production (1mk)
2. State **two** reasons why inbreeding can be recommended in livestock (1mk)
3. State **four** causes of infertility in dairy cattle (1mk)
4. (a) List any **four** farm structure that are necessary for handling dairy animals (2mks)  
 (b) Give **two** reasons why walls of dairy sheds should be white washed instead of painted with water or oil paints
5. List any **four** pieces of information which a farmer should enter into the breeding record of a dairy cow (2mks)
6. Give **two** reasons for drying off a dairy cattle (2mks)
7. Name two dual purpose sheep breeds (2mks)
8. Give **two** uses of ox- drawn tine harrows (2mks)
9. State **two** uses of hive tool during honey harvesting (1mk).
10. Name **two** parts of a building truss (1mk).
11. State **four** disadvantages of free-range system of rearing poultry (2mks)
12. State various activities carried out before milking dairy production (2mks)
13. State **four** reasons for feeding the bees (2mks)
14. State **four** advantages of farm mechanization (2mks)
15. State **four** measures that should be taken to prevent an outbreak of New castle disease in poultry (2mks)
16. State the functions of each of the following components of a tractor engine (2mks)
  - (a) Carburetor (1mk)
  - (b) Spark plug (1mk)
  - (c) Ignition coil (1mk)

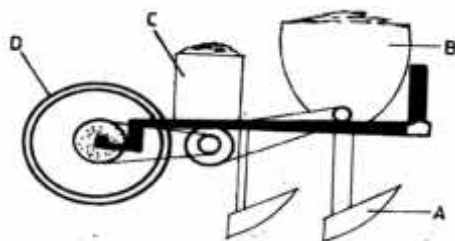
**SECTION B**

**Answer All questions in this section in the space provided**

17. The diagram below illustrates a farm structure . Study it carefully and answer the questions that follow

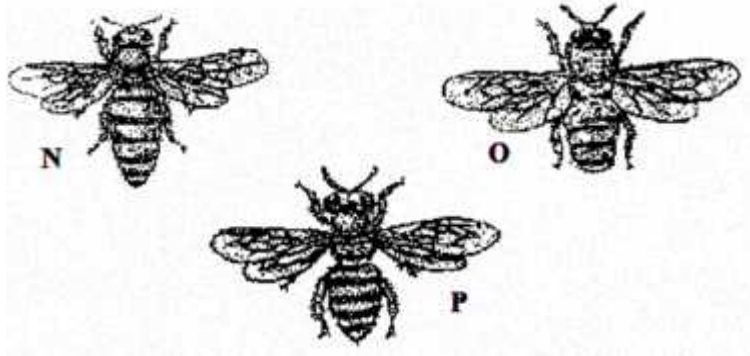


- (a) Name the parts labelled V,W,Y and Z (2mks)
  - (b) State three maintenance practices carried out on the above structure (3mks)
18. The diagram below shows a farm implement . Study it and answer the questions that follow



- (a) Identify the farm implement illustrated above (1mk)
- (b) State **four** maintenance practice carried out on the farm implement above (4mks)

19. Study the illustrations below and then answer the questions that follow



- (a) Name the types of bees labelled N, O and P (1 ½ mks)  
 (b) State **two** functions of bee labelled P in the colony (2mks)  
 (c) Name **three** parasites that attack the bees in the colony (1½mks)
20. The diagram below shows an animal disease . Use it to answer the questions that follow



- (a) Identify the disease the animal was suffering from (1mk)  
 (b) Name the causal organism of the disease (1mk)  
 (c). State **three** main symptoms of the disease that would confirm the disease the animal was suffering from (3mks)

### SECTION C (20 MKS)

Answer Any two questions from this section in the spaces provided after question 20

- 21 (a) Describe the functions of the various parts of a spray race (14mks)  
 (b) Outline the procedure of castrating a bull using a burdizzo (6mks)
- 22 (a) Outline the economic importance of parasite in livestock production (10mks)  
 (b) Describe the physical characteristics of good gilt for breeding (10mks)
23. (a) Explain the various factors that ensure clean milk production (8mks)  
 (b) Outline the various preparation and management practices carried out on a broody hen before incubation (7mks)  
 (c) State **five** characteristics of livestock roughage feedstuff (5mks)

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**AGRICULTURE****FORM 4****TIME: 2 HOURS**

1. Light intensity;  
Light duration;  
Light wavelength;  
 $2 \times \frac{1}{2} = (1mk)$
2. To transfer land from white settlers to Africans;  
To reduce population pressure in African resources;  
To solve unemployment problems;  
To increase agricultural production through better; method of land utilization;  
To settle farmer employee of European Farmers;  
 $2 \times \frac{1}{2} = (1mk)$
3. Gradual reduction on frequency and amount of watering;  
Gradual reduction on shading;  
Gradual reduction on mulching;  
 $2 \times \frac{1}{2} = (1mk)$
4. **Advantages of overhead irrigation**  
Chemicals and fertilizers can be applied together with water;  
Even distribution of water;  
Sprinkler systems are easily moved;  
Practicable in slopy areas;  
 $4 \times \frac{1}{2} = (2mks)$
5. Trap crop- Growing a crop before the main crop to attract a pest and then destroy it;  $1 \times 1 = (1mk)$
6. **Reasons for practising minimum tillage**  
Maintain moisture content;  
Reduction in costs of cultivation;  
Maintains soil structure;  
Reduces root disturbance ;  
 $3 \times \frac{1}{2} = (1\frac{1}{2} mk)$
7. **Insect pest that attack sorghum**  
Stem borer;  
Aphids;  
Sorghum midge;  
 $2 \times \frac{1}{2} = (1mk)$
8. **Conditions when opportunity cost is zero**  
No alternative enterprises;  
When the goods are abundant;  
Where production are free;  
 $2 \times \frac{1}{2} = (1mk)$
- 9 (a) **Reasons for practising grafting in citrus**  
Shorten maturity age ;  
Repair of damaged trees;  
Facilitate changing the top of the tree from being undesirable to desirable;

- Makes it possible to grow more than one type of fruit on the same plant;  $(3 \times \frac{1}{2} = 1\frac{1}{2} = \text{mks})$
- b. Callandra - Heat treatment /light burning;  $\frac{1}{2} \text{ mk}$   
Rice - Soaking in cold water;  $\frac{1}{2} \text{ mk}$
10. **Advantages of mixed pasture**  
Higher yields per unit area;  
High nutritive value;  
Improve soil fertility due to nitrogen fixation;  
There's security against total pasture loss / failure;  $2 \times \frac{1}{2} = (1 \text{mk})$
11. **Principles of Co-operative Society in Kenya**  
-Open Membership;  
- Equal rights;  
- Interests on shares;  
- Withdrawal from membership is voluntary;  
- Loyalty and faithfulness;  
- Education;  
- Non -profit motive;  $4 \times \frac{1}{2} = (2 \text{mks})$
12. **Types of production function**  
- Increasing returns production function;  
- Decreasing returns production function;  
- Constant returns production function;  $3 \times \frac{1}{2} = (1\frac{1}{2} \text{ mks})$
13. **Properties of soil influenced by texture**  
- Drainage;  
- Aeration / porosity;  
- Water holding capacity/ permeability / capillarity;  
- Cation exchange capacity;  $4 \times \frac{1}{2} = (2 \text{mks})$
14. **Agricultural support services available to livestock farmer**  
- Banking services;  
- Credit services;  
- Extension and research services;  
- Artificial insemination services;  
- Insurance services;  
-Veterinary services A.I;  
- Seminar training services;  $4 \times \frac{1}{2} = (2 \text{mks})$
15. **Factors that influence soilfluction**  
- Slope of land;  
- Nature of the material;  
- Climate;  
- Vegetation cover;  
- Human activities;  
- Forces within the earth's crust;  $4 \times \frac{1}{2} = (2 \text{mks})$



- 16 **Factors that affect the selectivity of herbicide**  
 - Stages of growth of plant;  
 - Plant morphology and anatomy;  
 - Mode of action;  
 - Environmental factors;  $4 \times \frac{1}{2} = (2mks)$
17. **Types of product - product**  
 -Joint products e.g milk and butter, honey and wax.  
 Beef and skin;  
 - Competitive product - Dairy and beef, wheat and maize  
 - Supplementary product - Poultry and vegetable;  
 - Complementary products - Dairy and pigs minor crop in the main crop interplanted Beans and coffee  $2 \times \frac{1}{2} = (1mk)$
18. They are usually high yielding;  
 Are free from pest and disease attack;  
 Are free from foreign materials;  
 High germination percentage;  $3 \times \frac{1}{2} = (1 \frac{1}{2}mk)$
19. Silage;  
 Hay;  
 Direct grazing;  $2 \times \frac{1}{2} = (1 mk)$
20. Elasticity of demand - degree of responsiveness of demand to change in price;  $1 \times 1 = 1mk$   
 Elastictly of supply - degree of responsiveness of supply to change in price;  $1 \times 1 = 1mk$

**SECTION B (20mks)**

- 21(a) **Identity of pests;**  
 X- Maize weevil;  $1 \times 1 = 1mk$   
 Y- Bean weevil/bruchid;  $1 \times 1 = 1mk$   
 Z- Flour weevil;  $1 \times 1 = 1mk$
- (b) **Classification of pests based on mode of feeding**  
 (i) Those with biting and chewing mouth parts;  
 (ii) Those with piercing and sucking mouth parts;  $2 \times 1 = 2mks$
- 22(a) **Identify of practices**  
 A- Staking;  $1 \times 1 = 1mk$   
 B- Propping;  $1 \times 1 = 1mk$
- (b) - Facilitate easy penetration of spray / during pests and disease control;  
 - Ensure harvesting of clean fruits;  
 - Prevent attack by soil borne pests and diseases;  
 - Facilitate easy harvesting of the fruits;  $3 \times 1 = 3mks$
23. a) **Identify of parts**  
 A- Crown;  $1 \times 1 = 1mk$   
 B- Slip;  $1 \times 1 = 1mk$   
 C- Sucker;  $1 \times 1 = 1mk$

b) **Ecological factors influencing sweetness of fruit**

Temperature /High temperatures;

 **$1x \frac{1}{2} = \frac{1}{2} mk$** 

Soil type;

 **$1x \frac{1}{2} = \frac{1}{2} mk$** c) **Best part for propagation;**

Part B/slip;

 **$1x \frac{1}{2} = \frac{1}{2} mk$** 

Their growth is faster/take 22 months from planting to maturity

 **$1x \frac{1}{2} = \frac{1}{2} mk$** 24. a) **Identify of weeds P and Q**P- stinging Nettle (*urtica massaico*); **$1x1 = 1mk$** Q- Striga (witch weed) *striga hermontheca*; **$1x1 = 1mk$** 

b) P - Difficult to handle and control because they irritate the workers thus reducing their efficiency;

 **$1x1 = 1mk$** 

Q - Is parasitic to cultivated crops mainly cereals;

 **$1x1 = 1mk$** 

c) - Crop rotation with crops of other families other than the graminacea;

 **$1x1 = 1mk$** **SECTION C**

- 25(a) - Crop rotation; to help break the life cycle of pathogens;  
 - Roqueing; to stop spread of diseases  
 - Closed season ;to help to break life cycle of pathogens;  
 - Early planting;for crops to establish faster before attack;  
 - Pruning; creat enfaavourable micro-climate for some pathogens;  
 - Proper spacing minimise disease spread ;  
 - Weed control; prevent harbouring of some pathogens;  
 - Application of appropriate chemical; to kill pathogens;  
 - Quarantine; to prevent introducing pathogens into the farm;  
 - Use of clean equipment; reduces the chances of contamination with pathogens;  
 - Proper plant nutritions; to increase disease resistance and to controll defficiency diseases;  
 - Use of disease free materials; to prevent introduction of pathogens in the field;  
 - Destroy crop residue ; to kill pathogens and prevent spread of diseases;

 **$Practice - 10 x \frac{1}{2} = 5mks$**  **$Explanation = 10x \frac{1}{2} = 5mks$** 

- (b) - Prepare the silo before harvesting the crops;  
 - Cut the crops at appropriate stage and wilther for 6-12 hrs to about 65-75% moisture content (appropriate moisture content);  
 - Wilt the crop up to (65-75%) appropriately;  
 - The crop is chopped and put into silo; compacting every 10 - 12cm layer;  
 - The silo should be filled rapidly as possible;  
 - The ensiled materials should have a "ridge" or hump appearance;  
 - Temperature should be checked regularly;  
 - For high temperature(above 32.2°C) sprinkle water and reduce compaction  
 - For temperature below (above 32.2°C) (low temperature ) temperature increase compaction and add mollasses / dry materials;  
 - Ensiled materials should be covered with a polythene sheet (or layer of dry grass) to make it air and water tight;  
 - Cover with a thick layer of soil maintaining a "ridge" \appearance  
 - Dig trench round the silo to drain rain water;

 **$10x1 = 10mks$**

26(a) **Five factors considered in choosing type of irrigation**

- (i) **Capital availability**; - This determines the type of irrigation to be used leg Drip and overhead irrigation require high initial capital for installation and maintenance;
- (ii) **Topography**; - Surface irrigation require flat land;
- (iii) **Water** - availability - surface irrigation requires large quantities of water while drip and overhead require little water;
- (iv) **Type of soil**; - Surface irrigation is suited for clay soil because they hold water for a long time
- (v) **Type of crop**; - Crops to be irrigated should have high value to justify the irrigation cost;
- (vi) **Availability of clean water**; - Drip irrigation and overhead require clean water to avoid blockage; **5x 2 = 10mks**

## 26 (b) - Intended use of the crop;

- Time within which to use the crop;
- Cost of the pesticide;
- When all the other methods are not adequate;
- The safety the pesticides to the user and environment; **(5x1 = 5mks)**

- c) -Population pressure on limited area; forcing the buying of several pieces of land in different places;
- Shifting cultivation practices; due to clearing and opening new pieces assuming and owning several scattered pieces of land;
- Inheritance; of pieces of land from different ancestors due to the traditional system ;
- Accumulation of land holdings by money lenders; as a result of debtors failing to pay ;
- Traditional settling of debts by individuals through offering pieces of land; thus owning several pieces of land;
- Compensation by government; when the government takes part of ones land for public use; **(5x1 =5mks)**

27 (a) **Marketing Functions**

- Buying farm produce from the producers;
- Assembling produce from scattered area of production;
- Transportation and distribution of produce to areas of production;
- Storage after harvest to minimize losses
- Processing to provide variety, increase value and prolong shelf life of products;
- Grading according to quality;
- Packing for easier handling transportation and storage;
- Collecting analysing and interpreting market information;
- Advertising to create or increase demand;
- Bearing risks such as damage, price fluctuations and physical deterioration;
- Packaging - for easier handling; **(10x1 = 10mks)**

## (b) - Prevent injury to the farmers and livestock;

- Avoid contamination of crops with weed seeds;
- Competition for growth factors e.g light, nutrients;
- Reduce multiplication /spread of weed seeds in crop field;
- Minimise cost of production;
- Reduce allelopathic effect of weeds to crop; **(5x1= 5mks)**

27( c) **Reasons for pruning coffee**

- To remove old and unproductive branches;
- To regulate bearing;
- To make harvesting easy by regulating heights of trees;
- To facilitate penetration of sprays;
- To allow better air circulation;
- Economic use of chemicals; **(5x1= 5mks)**

**GATUNDU NORTH SUB-DIVISION JOINT EXAMINATION - 2015***kenya certificate of secondary education.***443/2****AGRICULTURE****FORM 4****TIME: 2 HOURS****MARKING SCHEME**

1. Act of making male birds lose their male characteristics / rendering sterile; **1 x1=1mk**
2. - Increase genetic uniformity;  
 - To fix required characteristics;  
 - To get proven sire;  
 - To increase phenotypic uniformity; **2 x<sup>1</sup>/<sub>2</sub>=1mk**
3. - Damaged uterus - due to injuries infections;  
 - Infections e.g brucellosis;  
 - Retained placenta;  
 - Blocked fallopian tubes;  
 - Frematin - when the heifer are bull are twins; **4 x<sup>1</sup>/<sub>2</sub>=2mks**
4. crush/fence/milking shed/calf pen/stall/night bomas  
 handling yards/cattle shed **4 x<sup>1</sup>/<sub>2</sub>=2mks**
- (b) - To avoid poisoning by some chemicals;  
 - To discourage insects from inhabiting the shed;  
 - To avoid tainting of milk if shed is used immediately after painting; **1 x<sup>1</sup>/<sub>2</sub>=1mk**
5. - Date of service;  
 - Expected date of calving;  
 - Actual date of calving;  
 - Sex of the calve; **4 x<sup>1</sup>/<sub>2</sub>=2mks**
6. - Increase milk production after birth;  
 - Health growth of the unborn calf; **2 x1=2mks**
7. - Romney marsh;  
 - Corriedale;  
 - Hampshire down; **2 x1=2mks**
8. - Stirring soil /mixing fertilizers/manure into the soil;  
 - Breaking large soil clods;  
 - Levelling seed bed;  
 - Covering seeds;  
 - Gathering removing trash;
9. - Cutting off the honey combs into the honey container;  
 - Separating top bar by scrapping away the propolis holding them together; **2 x<sup>1</sup>/<sub>2</sub>=1mk**
10. - Rafter;  
 - Rafter balter;  
 - Ridge /king ;  
 - Strut ;  
 - Cross tie ;  
 - Fascia board ; **2x<sup>1</sup>/<sub>2</sub>=1mk**

- 11.- Birds are exposed to predators;  
 - Birds easily get lost;  
 - High losses of eggs;  
 - Eggs production due to wastage of energy;  
 - Birds are poorly feed ; **4x<sup>1</sup>/<sub>2</sub>=2mks**
- 12.- Restrain the animal in milking crush;  
 - Put milking utensils ready;  
 - Provide the cow with feed;  
 - Wash the udder using warm water and a towel;  
 - Strop the milk from each quarter on a strip cup to test for mastitis ; **2x1=2mks**
- 13.- Encourage fast multiplication of the bee;  
 - To maintain colony /prevent the bees from smarming;  
 - To attract bees in a new hive;  
 - To supplement sources of feed; **2 x <sup>1</sup>/<sub>2</sub> = (1 mk)**
14. - More work can be done within a short time/faster operations;  
 - Efficient timing of operation;  
 - Process quality work;  
 - Economise use of labour where labour cost are high  
 - Increase production of benefiting from economics of large scale production;  
 - Make work easier and enjoyable; **4 x <sup>1</sup>/<sub>2</sub> = (2mks)**
15. - Vaccinate birds at regular interval;  
 - Isolate/ destroy affected birds;  
 -Disinfect the house before bringing in new stock;  
 - Impose quarantine;  
 - Ensure proper farm hygiene;  
 - Obtain chicks from reliable sources; **4 x <sup>1</sup>/<sub>2</sub> = (2mks)**
16. (a) Mixes air and petrol/supplies air petrol mixture to the inlet manifold; **(1mk)**  
 (b) Provide sparks and introduce spark into the combustion chamber; **(1mk)**  
 (c) Stepping up low battery voltage to high voltage; **(1mk)**
17. (a) Naming of parts:  
 V- Inlet;  
 W- Pond;  
 Y-Dam/Dyke  
 Z-Spillway; **4 x <sup>1</sup>/<sub>2</sub> = (2mks)**
- (b) - Planting grass on top of walls to prevent soil erosion;  
 - Weeds growing around the ponds should be removed  
 - Proper fencing around the pond/replace damaged pests and wires;  
 - Cleaning the pond to remove foreign particles and other organisms  
 - Maintaining good level of water in the pond **(3 x 1= 3mks)**

18 (a) Identity of the farm implement ;

- Planter;

**1x1 = 1mk**

(b) Maintenance practices

- Moving parts should be lubricated;
- Seed hoppers and fertiliser containers should be cleaned after use;
- Nuts and bolts should be tightened ;
- Broken and horn out parts should be repaired and replaced ;
- Coulter tube should be free from any blockage for efficient seed passage; **4x1 (4mks)**

19(a) **Naming types of bees**

N- Queen bee;

**1x 1/2 = (1/2mks)**

O-Drone bee;

**1x 1/2 = (1/2mks)**

P- Worker bee;

**1x 1/2 = (1/2mks)**

b) **Functions of P in the colony;**

- Feed the queen, drones and the brood;
- Protect the hive from intruders;
- Collect nectar, pollen, tree resins, gums and water
- Build combs and seal cracks and crevices in the hive;
- Clean the hive;
- Make honey and beeswax

**2x1 = (2mks)**

c). **Pests that attack bees in the colony**

Ants;

Wax moth;

Bee house;

Honey badgers;

**Any 3x 1/2 = (1 1/2mks)**

20. a) Identify of the disease;

- Anthrax ;

**1x1 = (1mk)**

b). Causal organism of the disease;

- Bacterium/Bacillus anthracis;

**1x1 = (1mk)**

c). Animal is swollen on the underside of the body/excessive bloating of the stomach after death;

- Pigs throat swells and may cause death due to suffocation;
- In dead animal a tar - like watery blood comes off the orifices / nose/anus/mouth/ blood does not clot quickly;
- Carcass lacks vigor mortis;
- Blood stains in faeces and in milk

**3x1 = (3mks)**

21.(a) Drainage pipe; conducts the used chemicals back to the pump for recycling;

- Spray pipe systems: form component of spray race consisting of pipe filled with nozzles to atomise chemicals;
- Sieve is to filter sediment and other particles to prevent blockage of nozzles
- Guard rails; to allow animals walk singly and in one directions;
- Sump; for mixing chemical;
- Pump; forcing the dip wash through piping systems to nozzles;
- Pressure gauge; to measure the recommended working pressure of the pump'
- Side walls; provide support to the piping systems;

(b). - Restrain the animal

- With one hand, pull the testes to let them free from scrotal
- Using the other hand , place the cusp of burdizzo to grasp the scrotal neck
- With the free hand, locate the spermatic cord one testis and press the handle of the burdizzo till a snap sound is heard
- Repeat the pressing on the same spermatic cord but at a lower position below the first cut

- Repeat the procedure of crushing the spermatic cord on the other testis
- Release the animal

**7 x 1 = 7mks**

22(a) - They rob host animals of feed nutrients leading to poor health / Emaciation

- Blood sucking causes anaemia
- Damage the skins /hides lowering their market value
- Cause wounds creating routes for secondary infections
- Some like roundworms cause blockage in the alimentary canal leading to constipation and death
- Some e.g ticks cause irritation
- Some are disease vectors transmit diseases
- Cause abnormal growth in body tissues which they feed on
- Excrete toxic substances which cause digestive up sets to the host
- Carcass of host animal killed for meat are usually condemned as unfit for human consumption e.g bladder worms in beef and pork
- They increase cost of production

**10x1 = 10mks**

b) - Should have 12 teats or more

- Should have deep body conformation
- Should be long
- Should firm in fleshing
- Feet and legs should be strong
- Feet should be well spaced without inversion of nipples
- Well developed teats
- Well arched top line
- Well developed ham
- Legs should be well set apart
- Should have a clean cut towl

**10x1 = 10mks**

23. (a) Clean milking shed free from dust and odours done by locating it far from roads piggeries etc

- Healthy milking herd; animals should be tested regularly for milk borne diseases and treated accordingly
- Clean milking herd; flanks and the udder should be washed and dried using udder tomet
- Long hair on the flanks and udder should be clipped off regularly to avoid milk contamination
- Healthy milk man; milk man should be free from diseases
- Clean milk man ; milkman should be clean and with short finger nails and hair, hair should also be covered not to fall into milk
- Clean milking utensils; should be seamless and with fitted joints to facilitate cleaning/wash with clean hot soapy water rinse and sterilize
- Filtering milk; milk should be filtered to remove dust, hair etc
- Cooling milk; milk should be kept in cold room to slow down bacteria multiplication
- Avoid flavours in milk ; by avoiding feeds like mexican mer'gold , onions etc just before milking

**8 x 1 = 8mk**

23b.

- Provide the bird with a balanced feed;
- Provide adequate and clean water;
- Dust the bird with appropriate insecticides to control external parasites;
- Make a nesting box that is spacious to allow movement of the hen;
- Darken the box to the inside to discourage egg eating
- Put clean, warm and dry materials in the nesting box;
- Keep the nest in a well -ventillated place, free from draught ;

**(7 x 1= 7mks)**

23c.They are bulky;

- They are fairly high in crude fibre content;
- They have high water content: (succulent roughages);
- They are low in dry matter;
- They are high in carbohydrates but low in protein;

**(5 x 1= 5mks)**

**KIRINYAGA WEST SUB-COUNTY EFFECTIVE '40' EXAMINATION 2015  
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443/1

AGRICULTURE

PAPER 1

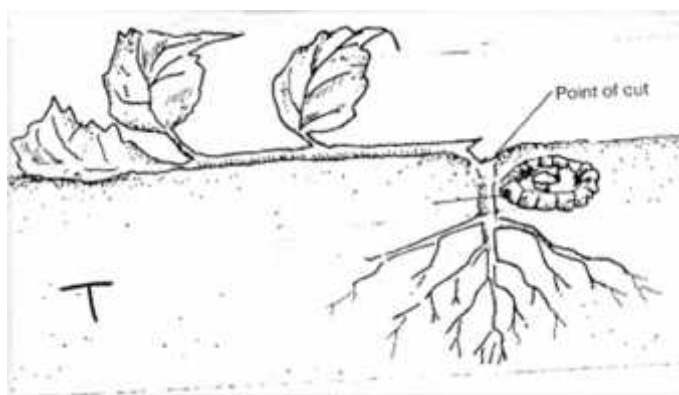
TIME: 2 HOURS

1. State **four** human factors that influence agriculture (2mks)
2. Name **two** areas of study that make agriculture to be regarded as a science (1mk)
3. State **two** positive effects of high temperature in crop production (1mk)
- 4(a). What is a seedbed? (1mk)
- (b) Outline **four** factors that influence number of cultivation operations when preparing a seedbed (2mks)
5. State **four** advantages of using organic manures over inorganic fertilizers (2mks)
6. Name **two** processing varieties of tomatoes (1mk)
7. A farmer is advised to apply 40 kgs  $P_2O_5$  per hectare of a crop under maize. He has access to single Super Phosphate fertilizers containing 20%  $P_2O_5$  (1½ mks)
- (a) Calculate how much single super phosphate (ssp) fertilizer he should apply in two hectare (2Ha) of his Land. (Show your working) (2mks)
- (b) Why is it advisable to apply phosphate fertilizers at planting time (1mk)
8. (a) What is forage defoliation? (1mk)
- (b) State three ways by which a farmer can make efficient use of forage crops (3mks)
9. List **four** benefits of agroforestry tree species to a farmer (2mks)
10. Give **two** examples of fixed costs in agricultural production (1mk)
- (b) List **two** sources of agricultural credit to a farmer (1mk)
11. Name **two** chemicals used in treatment of water (1mk)
12. What is the objective of pricking out in nursery management? (1mk)
13. State **two** practices that may prevent damage of seedlings during transplanting (1mk)
14. Name **four** post harvest practices done in the farm on cereals crops (2mks)
15. Name **two** types of records that a poultry farmer should keep (1mk)
16. State **two** main categories of crop pests (1mk)
17. Give **two** maintenance practices carried out on sprinklers (1mk)
18. Name **two** weeds that create unconducive working environment to a farmer (1mk)

**SECTION B ( 20 MARKS )**

**Answer all questions in this section**

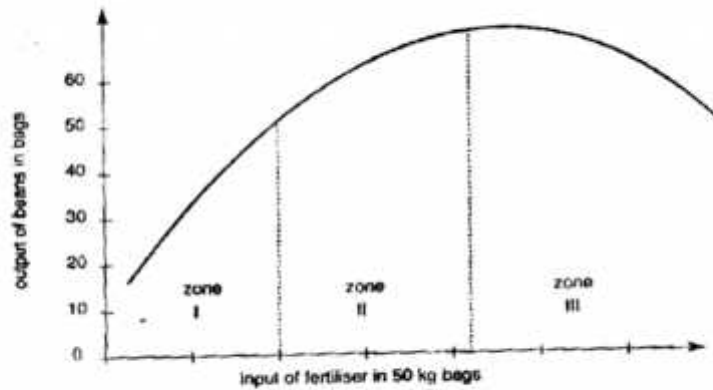
20. The diagram below and labelled T illustrates a field pest. Study the diagram carefully and answer the questions that follows



- (a) Identify the pest (1mk)
- (b) State a non-chemical method used to control the pest you have identified above (1mk)
- (c) Name **two** vegetable crops damaged by the pest above (2mks)
- (d) At what stage of crops growth is the pest more damaging (1mk)



20. The curve below illustrates the law of diminishing returns as used in agricultural economics. Study the curve and answer the questions that follows:-



- (a) What happens in each of the three zones I, II, and III in relation to fertilizers input to beans output (3mks)
  - (b) Amongst the **three** zones illustrated above, which zone is the rational zone of production . Give a reason (2mks)
21. The diagram below illustrate crop diseases. Study the diagrams carefully and answer the questions that follows :-



- (a) Identify the crop disease illustrated in diagrams
  - P: ..... (1mk)
  - Q: ..... (1mk)
- (b) Give the caustitive agent for each of the above diseases illustrated above (2mks)
  - P: ..... (1mk)
  - Q: ..... (1mk)
- (c) State **one** cultural method used in the control of diseases illustrated by Q (1mk)

22. The table below gives information for Mzee Kogi's farm for the year ending 31-12-2014

| Transaction          | Kshs.   | cts |
|----------------------|---------|-----|
| Dairy cattle         | 25,000  |     |
| Maize in store       | 10,000  |     |
| Buildings            | 150,000 |     |
| Potatoes for sale    | 3,000   |     |
| Fertilizers in store | 5,000   |     |
| Wool sheep           | 15,000  |     |
| Pigs                 | 7,000   |     |
| Land (100Ha)         | 160,000 |     |
| Machinery            | 10,600  |     |
| Feeds in store       | 600     |     |
| Office Equipment     | 1,400   |     |

The farm also has Ksh. 5000/= as cash in bank , 300/= as cash at hand. It was owed 3,000/= for sale of \\ beef and 5,000/= for milk sales. The farm owed Unga Feeds Ltd 5,000/= for concentrates and KGGCU 2,500/= for farm tools acquired on credit .

- (i) Draw a balance sheet for the farm for the year ending 31-12-201 (4mks)  
 (b) Was the business solvent or insolvent? for your answer (1mk)

**SECTION C (40marks )**

**Answer any two questions from this Section**

- 23 (a) Discuss the various factors that influence soil erosion (10mks)  
 (b) Describe the benefits of a land title deed to a farmer (5mks)  
 (c) State the precautions a farmer should undertake when collecting soil samples from a crop field (5mks)
24. (a) State and explain the various marketing functions undertaken in agriculture (10mks)  
 (b) Discuss the factors that are considered in drawing a farm plan (10mks)
26. (i) Discuss production of sorghum under the following sub-headings (4mks)  
 (a) Ecological requirements (4mks)  
 (b) Land preparation and planting (4mks)  
 (c) Pest and disease control (4mks)
- (ii) Discuss the factors that determine the choice of tools and implements used in tillage operations (6mks)

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AGRICULTURE

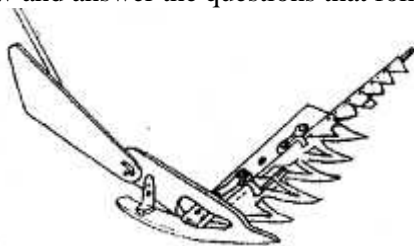
PAPER 2

TIME: 2 HOURS

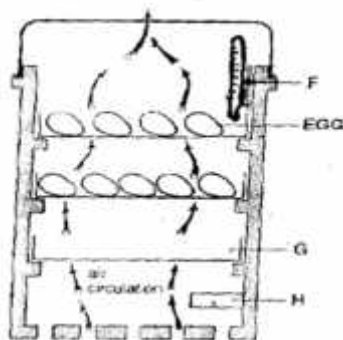
1. Give **two** importance of keeping livestock to a farmer (1mk)
2. What is the intermediate host of a tapeworm (*Taenia Solium*) ( $\frac{1}{2}$ mk)
3. Name the disease transmitted by the vector tsetsefly ( $\frac{1}{2}$ mk)
4. State **two** characteristics of roughages (1mks)
5. Give **four** uses of a crush in livestock production (2mks)
6. State **two** methods of controlling cannibalism in poultry (1mk)
7. State **two** advantages of using stones as construction materials (1mk)
8. Give **two** uses of wind as a source of power on the farm (1mk)
9. A breed of exotic dairy cattle is grey in colour, has a small head, protruding and pigmented eyes, black muzzle, hooves and switch . It produces lowest amount of milk amongst the four dairy breeds and has the highest butterfat content . Name the breed ( $\frac{1}{2}$ mk)
10. Which equipment is used to measure specific gravity of milk ( $\frac{1}{2}$ mk)
11. Define the following terms :
  - (i) Heifer .....(1mk)
  - (ii) Steer .....(1mk).
12. Name **two** protozoan diseases of livestock (1mk)
13. Name **two** tools equipment that can be used to castrate a bull (1mk)
14. Give **two** uses of a footbath in a cattle dip (2mks)
15. State the gestation periods of the following animals (1 $\frac{1}{2}$ mk)
  - (i) Sow.....
  - (ii) Cow.....
  - (iii) Doe/Nanny.....
16. List down **four** maintenance practices of mould board plough ((2mks)
17. Give a reason as to why birds lay soft shelled eggs ( $\frac{1}{2}$ mk)
18. Why should irish potatoes not be fed to rabbits? (1mk)
19. Give **two** examples of fresh water fish water fish species commonly reared in Kenya (1mk)
20. List **two** reasons for feeding bees (2mks)
21. Give **two** reasons as to why vitamins are important in livestock nutrition (2mks)
22. Give **four** causes of infertility in cattle (2mks)
23. State **two** methods of extracting honey (1mk)
24. Give **two** reasons for washing a cows udder with warm water during milking (1mk)
25. State **two** predisposing factors of foot rot disease in sheep (1mk)

**SECTION B ( 20 MKS)****Answer all questions in this section**

26. Study the diagram below and answer the questions that follow



- (a) Identify the implement illustrated in the diagram above ( 1mk)  
 (b) Give **one** function of the implement you have named in (a) above ( 1mk)  
 (c) Name a source of power that can be used to operate the implement (1mk)  
 (d) List **two** maintenance practices that can be carried out on the implement ( 2mks)
27. The diagram below illustrates a routine practice carried out in poultry farming. Study the diagram and answer the questions that follow.



- (a) Identify the structure illustrated in the diagram above (1mk)  
 (b) Name the parts labelled F, G and H . (3mks)  
 (c) State **two** other conditions other than air circulation in the structure that help to facilitate the practice carried out in the illustration you identified in (a) (2mks)
- 28 (a). A farmer is to prepare a ration for his pigs containing 20% CP using maize 8% CP and Soybean meal 36% CP Using Pearson's square method, calculate how much of each foodstuff the farmer would require to make 100kgs of the feed (show your working) (5mk)  
 (b) List **three** digestive enzymes found in the the duodenum (3mks)  
 (c) What is the importance of calcium grit in the digestive system of an avian or poultry (1mk)

**SECTION C ( 40 Mks)****Answer any two questions in this section**

- 29 (a) Discuss the uses of water in a animal's body (10mks)  
 (b) Describe the limitations of using animal power on the farm (10mks)
30. (a) Describe the essentials of clean milk production (10mks)  
 (b) Outline **five** reasons why bees swarm (5mks)  
 (c) Describe **five** predisposing factors of livestock diseases (5mks)
31. (a) Explain the importance of dehorning in cattle management (5mks)  
 (b) State **five** factors that are considered while siting a zero grazing unit (5mks)  
 (c) Discuss the factors a farmer should consider while culling layers in poultry farming (10mks)

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**443/1  
AGRICULTURE  
PAPER 1  
TIME: 2 HOURS**

**Marking scheme**

1.
  - Level of education & technology
  - Health (HIV & Aids)
  - Economy
  - Government Policy
  - Transport and communication
  - Cultural and religious beliefs
2.
  - Market forces

$4 \times \frac{1}{2} = (2mks)$
3.
  - Crop pathology
  - Entomology
  - Soil science/paedology
  - Genetics

$2 \times \frac{1}{2} = (1mk)$
4.
  - Hasten germination
  - Hasten crop maturity
  - Improves quality of some crops like citrus fruits and pineapples
  - Improves soil microbial activities

$2 \times \frac{1}{2} = (1mk)$
- 4(a) A seedbed is a piece of land measuring few square metres to several hectares where a crop is grown up to the time of harvesting  
*(1mk)*
- b.
  - Soil moisture content
  - Type of soil
  - Cost of operation
  - Size of seed/planting materials
  - Type of machinery available
  - Topography of the land/slope of the land.
  - Initial condition of the land
  - Skills of the operator
  - Time available to carry out the operation before planting

$4 \times \frac{1}{2} = (2mks)$
5.
  - Improves soil structure hence good aeration and drainage
  - Improve water holding capacity
  - Supply more than one nutrient to the crop
  - Improves soil microbial activities
  - Since it is dark in colour, it helps to modify soil temperature
  - Has a longer residual effect
  - It is locally available to the farmers

$4 \times \frac{1}{2} = (2mks)$
6.
 

|               |            |                             |
|---------------|------------|-----------------------------|
| - Cal - J     | - Pimabel  | - Prostar F <sub>1</sub>    |
| - Roma        | - Heinz    | - Onyx F <sub>1</sub>       |
| - San Marzano | - Rambo F1 | - Rio Grande F <sub>1</sub> |

$2 \times \frac{1}{2} = (1 mk)$
7.
 

|                  |                               |       |
|------------------|-------------------------------|-------|
| (a) 100kgs _____ | 40kgs                         |       |
| of SSP           | P <sub>2</sub> O <sub>5</sub> |       |
| ?                | _____                         | 20KGS |
|                  | P <sub>2</sub> O <sub>5</sub> |       |

$\frac{100 \times 20}{40} \times \frac{1}{2} = 500kgs/Ha \quad \frac{1}{2} \quad 500kgs \times 2Ha$

$= 1000kgs/Ha$

ssp

- (Reject: 1000kg; 1000 or any figure that is not fully defined)  $\frac{1}{2} \times 4 = (2mks)$   
(Penalise if the candidate does not show how he/she arrived at the answer)
- 8 (b) Phosphorous promotes root development and establishment  $(1mks)$   
a) Removal of forage by direct grazing or cutting to feed to livestock as fodder  $(1mks)$   
b) - Controlled grazing/Rotational grazing  
- Use of proper stocking rate  
- Conserving excess forage as hay or silage  
- Timely defoliation/grazing at right time  
- Grazing different classes of animals according to need  
- Stall feeding/cutting and feeding in a zero grazing unit  $(3 \times 1 = 3mks)$
- 9 - Source of woodfuel  
- Leguminous tree species help to fix atmospheric nitrogen into the soil  
- The leaves decompose to release humus into the soil  
- Source of food to both man and livestock  
- Trees serve as windbreaks  
- Conservation of soil and water  
- Source of construction materials i.e. timber, poles and rails  
- Trees add beauty to the environment/ Aesthetic value  
- Some tree species have medicinal properties (rej:some trees are medicines)  $4 \times \frac{1}{2} = (2mks)$
- 10 (a) - Rent  
- Depreciation of farm machinery  
- Buildings  
- Salaries of permanent labour  $2 \times \frac{1}{2} = (1mk)$   
b) - Co-operative societies  
- Crop boards  
- Commercial banks  
-Agricultural Finance Corporation ( AFC)  
- Settlement fund Trustees  
- Hire Purchase Companies  
- Non-Governmental Organisations(NGO's)  
- Individuals  $2 \times \frac{1}{2} = (1mk)$
- 11 - Sodium bicarbonate (Soda Ash)  
- Aluminium sulphate (Alum)  
- Chlorine  $2 \times \frac{1}{2} = (1mk)$   
(rej; water guard)
- 12 To reduce overcrowding of seedlings and thus allow seedlings to grow strong and healthy without much competition  $= (1mk)$   
 $4 \times \frac{1}{2} = (2mks)$
- 13 -Thorough watering of the nursery bed 2-3 hours before transplanting  
- Lifting seedlings from the nursery bed using a gardener's trowel. (rej: using a trowel)  $2 \times \frac{1}{2} = (1mk)$
- 14 -Drying  
- Shelling/Threshing  
- Winnowing  
- Sorting and grading  
- Dusting  
- Packaging  $4 \times \frac{1}{2} = (2mks)$
- 15 - Feeding records  
- Health records  
- Egg production records  
- Labour analysis records  
- Marketing records  $2 \times \frac{1}{2} = (1mk)$
- 16 - Storage pests  
- Field pests  $2 \times \frac{1}{2} = (1mk)$

17. -Repair/replace worn out parts/broken parts  
 - Unblock clogged/blocked nozzles  
 - Lubricate the moving parts to reduce friction  $2 \times \frac{1}{2} = (1mk)$
18. - Double thorn (*Oxygonum sinuatum*)  
 - Stinging nettle (*Urtica masaica*)  
 - Devil's horse whip (*Archyranthes aspera*)  $2 \times \frac{1}{2} = (1mk)$
- SECTION B (20mks)**
- 19 (a) Cutworm (1mks)  
 (rej:caterpillar)
- (b) - Physical killing  
 - Early tillage to expose the pest to sun's heat  $1 \times 1 = (1mk)$
- (c) - Kales  
 - Cabbages  
 - Tomatoes  
 - Spinach  $(2 \times 1 = 2mks)$
- (d) Seedling stage  $(1 \times 1 = 1mk)$
20. (a) Zone I : An input in fertlizer results to an increase in bean output  $(1mk)$   
 Zone II: An increase in the units of fertilizer input results in a decrease output of beans till it reaches a maximum  $(1mk)$   
 Zone III: Any further increase in fertilizers input results in a negative output of beans  $(Total = 3mks)$
- (b)\_Zone II (1mk)  
 Reason : Because the total physical output of beans reaches a maximum  $(1mk)$   
 **$(Total = 2mks)$**
21. (a) P- Bacterial wilt  $(1mk)$   
 Q- Maize smut  $(1mk)$   
 **$(Total = 2mks)$**
- (b) P- Bacteria (*pseudomonas solanacearum*)  
 Q- Fungi (*ustilago maydis*)
- (Accept pseudomonas sp rej: Pseudomonas spp)*  
*(Accept : Ustilage sp rej ustilago spp)*
- (c) - Crop rotation  
 - Field hygiene  
 - Rogueing  
 - Using clean planting material certified \seeds  $1 \times 2 = 2mks$

22. (i) Balance sheet for Mzee Kogi's Farm as at 31-12-14

| Liabilities $\frac{1}{2}, mk$       | Shs.              | Cts | Assets $\frac{1}{2}, mk$ | Shs.    | Cts                  |
|-------------------------------------|-------------------|-----|--------------------------|---------|----------------------|
| KGUCU                               | 2,500             | 00  | Pigs                     | 7,000   | 00                   |
| Sigma Feeds                         | 5,000             | 00  | Maize in store           | 10,000  | 00                   |
| Total liabilities $\frac{1}{2}, mk$ | 7,500             | 00  | Potato for sale          | 3,000   | 00                   |
|                                     |                   |     | Fertilizer in store      | 5,000   | 00                   |
|                                     |                   |     | Feeds in store           | 600     | 00                   |
|                                     |                   |     | Cash in hand             | 300     | 00                   |
|                                     |                   |     | Cash in bank             | 5,000   | 00                   |
| Net worth                           | 411,800           | 00  | Debts receivable         | 3,000   | 00                   |
|                                     |                   |     | Beef                     | 3,000   | 00 $\frac{1}{2}, mk$ |
|                                     |                   |     | Milk                     | 5,000   | 00                   |
|                                     |                   |     | Dairy Cattle             | 25,000  | 00                   |
|                                     |                   |     | Buildings                | 150,000 | 00                   |
|                                     |                   |     | Woolsheep                | 15,000  | 00                   |
|                                     |                   |     | Land                     | 160,000 | 00                   |
|                                     |                   |     | Machinery                | 10,000  | 00                   |
|                                     |                   |     | Office Equip.            | 1,400   | 00                   |
|                                     | $\frac{1}{2}, mk$ |     | Total Assets             | 419,300 | 00 $\frac{1}{2}, mk$ |
|                                     | 419,300           | 00  |                          |         |                      |

- Correct entries (Liabilities and Assets)
- Total liability
- Total assets
- Net worth

(ii) The business is solvent

The value of assets exceeded value of liabilities

$\frac{1}{2}$  mk (Total = 1mk)

### **SECTION C**

23 (a) **Factors influencing soil erosion**

#### **Amount and rainfall intensity**

- The higher the amount and intensity of rainfall the greater the rate of soil erosion

#### **Slope of the land/gradient of the land**

- The steeper the slope the higher the rate of erosion

#### **Type of soil**

- Sandy soils are more prone to erosion than clay and loamy soils

#### **Soil depth**

- Shallow soils saturate quickly with water and are therefore more prone to erosion than deep soils

#### **Vegetation cover**

- Vegetation safeguards soil particles against erosion agents,

#### **Overstoking**

- This results to overgrazing hence leaving bare soil and thus high erodibility

#### **Deforestation**

- Indiscriminate felling of trees exposes soil to soil agents

#### **Indiscriminate burning of vegetation.**

- This destroys vegetation cover
- Planting of annual crops on steep slopes
- This leads to frequent tillage operations that exposes soil to erosion

#### **Clean weeding;**

- This leaves the soil more unprotected hence erosion

#### **Ploughing up and down the slope**

- Creates waterways that encourage rill and gully erosion

**1 x 10 = 10mks**

(Rej: A statement without accurate explanation)

(b) (i) It can be used as security or collateral against credit/loans

(ii) Reduces land disputes

(iii) It gives tenure security thus encouraging long term investment and permanent projects and conserve soil.

(iv) It enables one to lease either part or whole of the land and thus get income from it.

(v) A farmer owning a title deed can sell his land at free will.

**(5x1 = 5mks)**

c) Do not collect samples

- On swampy areas
- Along river banks
- On old compost heap sites
- On old construction sites
- Under live hedges
- Near livestock housing
- On dead furrows
- On terraces
- Along tree boundaries

**(5x1 = 5mks)**

24.(a) **Buying and assembling**

- Goods are acquired from farmers upon payment of cash and assembled at one point for ease of collection.

#### **Transporting and distribution**

- This aims at availing goods to the consumers .

It should be efficient to prevent perishability

#### **Storage :**

- Proper storage is important to prevent loss of quality through perishability i.e cold storage of milk, eggs, meat, french beans.

#### **Packing**

- This protects the produce against damage, theft and adulteration

- **Processing** - This is necessary to prepare the produce for consumption. It adds value to the produce

#### **Grading and standardisaton**

- The produce is sorted into different lots and then established in some uniformity of quality and quantity.

This helps in pegging prices

#### **Packaging**

- Enables farm produce to be handled with convenience and also prevents adulteration, physical damage , theft ,



tampering and substitution.

- **Collection of market information**

This involves knowledge of demand and supply and creates efficient marketing strategy

- **Selling**

- The exchange of the farm produce either in raw form or processed for money.

- It involves display, advertising, and bargaining for fair prices

- **Financing**

- Sourcing of money to finance all the activities from original buying of raw produce to processed product.

- **Bearing of risks**

- This is the divergence between expected and actual outcome in regard to the purchased produce in raw form to the price of the final processed product (10x 1= 10mks)

(b) **Factors considered in drawing a farm plan**

(i) **Size of the farm**

- A large farm hosts several enterprises while a small farm can only hold few enterprises

(ii) **Environmental factors**

- Climate, soil, topography of a place determine the specific enterprises to be established on a farm.

(iii) **Current trends on labour market**

- This determines the availability of labour especially during peak periods

(iv) **Farmers objectives and preferences**

- Farmers interests are put into consideration because they have a psychological effect on the state of enterprise ownership and commitment

(v) **Possible production enterprises**

- Consider the requirements of possible enterprises in relation to environmental factors, size of the farm, existing markets and price trends

(vi) **Existing market conditions and price trends**

- Price trends affect production schedules and determine what the farmer should produce

(vii) **Availability and cost of farm inputs**

- A farmer should embark on an enterprise that has affordable and available inputs

(viii) **Government policy :-**

- The farmer should stick to the laid down policies that define how production is to be done. i.e using safe food production strategies

(ix) **Security**

- Certain enterprises must be near homestead for security reasons i.e. poultry, dairy, rabbits etc. They also require close supervision

(x) **Communication and transport facilities**

- Sound communication and transport network is facilitates good production and produce delivery to the market

25 (i) a) Ecological requirements

Soils - Deep, fertile, well drained.

Rainfall - 420mm - 630mm per annum and well distributed throughout the year

Altitude - 0 - 1500m a.s.l

Temperature - 26-30°C is appropriate

( 4 x 1 = 4mks)

b) Land preparation

- At onset of rains

- Dig deep, clear all weeds

- Harrowing is necessary to get fine tilth

- Broadcast seeds and work the seeds into the soil using a spring tine harrow

( 4 x 1 = 4mks)

c) Pests

Sorghum shoot fly

Damage: Feeds on young stem causing weakening and lodging

Control: - Early planting

- Closed season

- Spraying suitable insecticides

Birds : Quelea quelea, weaver, birds, doves

Damage : - Eating grains at milk stage

Control :- Scaring

- Planting resistant (goose necked var)

Stem borers:

Damage: Feeds in the funnels and later destroys the stem

Control: - Field hygiene  
 - Early planting  
 - Using suitable insecticides

Diseases

Leaf blight

Cause: Fungi

Symptoms: Brown necrotic patches on the leaves

Control: - Spraying appropriate fungicides  
 Field hygiene

Anthracnose:

Cause: Fungi

Symptoms: - Black necrotic patches on the stem and leaves

Control : - Spraying appropriate fungicides  
 - Field hygiene

Sooty stripes: Cause, fungi

Symptoms: Grey mass of powder on the inflorescence

Control: - Spraying fungicides  
 - Field hygiene  
 (2mks for 2 pests & control)  
 (2mks for 2 diseases & control)

*(rej: Any answer that combines or gives a general pest and disease control strategy)*

ii) **Factors that determine the choice of tools and implements used in tillage operations**

- Availability of the tools and equipment.
  - Skills and knowledge of using the tools and equipment
  - Cost of using the tool or implement.
  - Topography of the land i.e rollers cannot be used on steep land
  - Soil moisture content eg: some tractor drawn implements may not be ideal on wet soils
  - Size of planting materials
  - Type of soil thus heavy soils require heavy tillage implements drawn using high power output
  - Tillage required i.e harrows leave a fine tillage than disc plough.
  - Depth of cultivation- Heavy implements give deep penetration into the soil
  - Condition of the land i.e a land with obstacles requires a disc plough that rides over obstacles
- ( 6 x1 =6mks)**

**KIRINYAGA WEST SUB-COUNTY EFFECTIVE '40' EXAMINATION 2015***kenya certificate of secondary education.*

443/2

**AGRICULTURE****PAPER 2****TIME: 2 HOURS*****Marking scheme***

1. - Source of income
  - Source of food (meat, milk, honey, eggs)
  - Cultural uses (Dowry payment, recreation, status symbol, medium of exchange)
  - Source of power (rej; source of labour)
  - Provision of raw materials *2 x ½ = (1 mk)*
2. - Pig *(½ mk)*
3. Nagana /trypanosomiasis *(½ mk)*
4. - Low protein content
  - High fibre content
  - High level of carbohydrates *2 x ½ = (1 mk)*
5. **Restraining animals during**
  - Artificial insemination
  - Dehorning
  - Administration of drugs
  - Vaccination
  - Hoof trimming
  - Milking
  - Identification
  - Castration of bulls
  - Spraying acaricides to cattle *4 x ½ = (2mks)*
6. - Debeaking
  - Hanging edible green vegetables to keep birds busy
  - Provide enough space to prevent overcrowding
  - Culling aggressors *2 x ½ = (1 mk)*
7. - Fire proof
  - Weather resistant
  - Does not rot
  - Not destroyed by pests
  - Durable
  - Strong *2 x ½ = (1 mk)*
8. - Winnowing
  - Generating electricity (wind generators)
  - Turning a windmill *2 x ½ = (1 mk)*
9. Jersey *(½ mk)*
10. Lactometer *(½ mk)*
11. - Heifer - Young female cattle between weaning and first calving *(1mk)*  
 Steer - Young castrated male cattle *(1mk)*
- 12.- Trypanosomiasis
  - East coast fever
  - Coccidiosis
  - Anaplasmosis
  - Heart water disease
  - Red water disease *2 x ½ = (1 mk)*
13. - Burdizzo
  - Elastrator and rubber ring
  - Sterile knife or scapel blade *2 x ½ = (1 mk)*
14. - Remove mud and reduce acaricide contamination
  - Treat hooves with copper sulphate to prevent hoof rot disease *(2x1=2mks)*
15. Sow: 115 days  
 Cow: 285 days  
 Doe/Nanny: 150 days *3 x ½ = (1 ½ mk)*

16. - Clean after use  
 - Tighten loose nuts and bolts  
 - If not in use store in a shed (rej; shade)  
 - Coat metallic parts with old engine oil to prevent rusting  
 - Replace broken share  
 - Sharpen blunt share **4 x ½ = (2mks)**
17. Calcium and phosphorous deficiency in the diet **(½ mk)**
18. - They contain a poisonous substance called solanin **(1mk)**
19. - Tilapia  
 - Black carp  
 - Cat fish  
 - Nile perch  
 - Blue gill **2x ½ = (1 mks)**
20. - To maintain the colony together  
 - To encourage multiplication of bees  
 - To supplement what bees get from flowers **2x1 (2mks)**
21. - Promote high growth rate  
 - Build resistance to diseases  
 - Enhance breeding  
 - Help in blood clotting  
 - Help in bone formation  
 - Act as organic catalysts in metabolic reactions  
 - Help in muscular activity **2x1 (2mks)**
22. - Freemartin syndrome  
 - Poor nutrition  
 - Infections like Brucellosis  
 - Blocked fallopian tubes **4x ½ = (2mks)**
23. - Heat method  
 - Crush and strain method  
 - Centrifugal method **2x 1/2 = (2mk)**
24. - To stimulate milk let -down  
 - To remove dirt **2x ½ = (1mk)**
25. - Grazing in wet areas  
 - Living in a dump housing  
 - Overgrown hooves **2x ½ = (1mk)**
- SECTION B ( 20mks)**
26. (a) Reciprocating mower **(1mk)**  
 (b) Harvesting rhodes grass for hay making **(1mk)**  
 (c) Tractor **(1mk)**
- (c) - Clean after use  
 - Lubricate moving parts  
 - Replace broken knives  
 - Tighten loose nuts and bolts  
 - Sharpen the blunt knives  
 - If not in use, store in shed (rej; shade)  
 - Coat the metallic parts with old engine oil to prevent rusting **2x1 = (2mks)**
27. (a) Incubator /egg incubator **(1mk)**  
 (b) F- Thermometer **(1mk)**  
 G- Tray for holding water **(1mk)**  
 H- Source of heat **(1mk)**  
 (c) : Relative humidity of about 60%  
 : Egg turning  
 : Optimum temperature of 37.5<sup>0</sup>c - 39.4<sup>0</sup>c

---

|         |                            |                           |
|---------|----------------------------|---------------------------|
| Maize   | $\frac{16}{28} \times 100$ | = 57 kgs of maize         |
| Soybean | $\frac{12}{28} \times 100$ | = 43 kgs of soybean meals |

= 5mks

(b) Pancreatic amylase

Lipase

Trypsin

3x 1 = (3mks)

(c) - Mechanical digestion of food in the gizzard

- Provision of calcium ions in the diet

1x1 = (1mk)

**SECTION C**

29 (a) - It is a component of the animals body cells and many body fluids such as blood

- Transportation of nutrients from one part of the body to the other

- Makes cells turgid, maintains shape of the body cells

- A medium for biochemical reactions in the body e.g.: digestions

- Helps to regulate body temperature through sweating and evaporation

**GEM SUB-COUNTY JOINT EVALUATION**  
**443/1**  
**AGRICULTURE**  
**PAPER 1**

**SECTION A: (30 Marks)**

*Answer all the questions in this section in the spaces provided.*

1. State three conditions under which shifting cultivation is practiced in agiven area. (1½ marks)
2. State four activities that are carried out during soil sampling in the field. (2 marks)
3. Give four conditions that necessitate clearing of land. (2 marks)
4. Give three ways in which nitrogen is removed from atmosphere. (1½ marks)
5. Mention four advantages of using polythene sleeves in the establishment of seedlings. (2 marks)
6. What are four effects of education and technology on agriculture? (2 marks)
7. List two maintenance practices of sub-surface irrigation. (1 mark)
8. Give four reasons for keeping health records. (2 marks)
9. State four factors that affect the selectivity and effectiveness of herbicides. (2 marks)
10. State four roles of additives in silage making. (2 marks)
11. State two precautions to be taken when harvesting cotton. (2 marks)
12. State four reasons why sub-soiling is important as an operation of land preparation. (2 marks)
13. Name any two diseases that affect bean production in the field. (1 mark)
14. a) Differentiate between over sowing and under sowing. (1 mark)
- b) Given the maize is planted at a spacing of 75 x25cm. Calculate the plant population in a plot of land measuring 4m x 4m. Show your working. (2 marks)
15. State four sources of agricultural credit to farmers. (2 marks)
16. List four management practices which are used to maintain pasture productivity. (2 marks)

**SECTION B: (20 MARKS)**

17. The illustration below shows one of the grazing systems commonly used by farmers.
  - a) Identify the grazing system (1 mark)
  - b) With the help of arrows indicate the movement of livestock from one paddock to the next. (1 mark)
  - c) What is the purpose of the part labeled Y on the illustration. (1 mark)
  - d) State two advantages of this system of grazing. (1 mark)
18. The diagram below represents parts of a water harvesting structure. Study it carefully and answer the following questions.
  - a) Name the parts labeled A and O on the diagram. (2 marks)
  - b) Identify the method of water harvesting illustrated. (1 mark)
  - c) State the use of the part labeled B. (1 mark)
  - d) State two maintenance practices needed for part labeled E. (2 marks)
19. Below is an illustration of a maize cob attacked by smut disease. Study it carefully and answer the questions that follow.
  - a) Beside what is visible on the maize cob. State two other symptoms of the disease. (2 marks)
  - b) State two control measures of the above disease. (2 marks)
20. The illustration below shows materials used in vegetative propagation labeled A and B.
  - i) Identify materials A and B (1 mark)
  - ii) Name the parts labeled X and Y (1 mark)
  - iii) Name the preparation method used to get the vegetative material labeled B. (1 mark)
  - iv) State three disadvantages of vegetative propagation. (3 marks)

**SECTION C: (40 MARKS)**

Answer any two questions from this section in the spaces provided at the end of the section.

21. a) Explain how various practices carried out in the field help to control crop diseases. (12 marks)
- b) What are the advantages of grass legume pasture over a pure grass pasture? (8 marks)
22. a) Describe the establishment of kales under the following sub-headings:
  - i) Establishment in the nursery (3 marks)
  - ii) Transplanting of seedlings. (8 marks)
- c) Explain the various ways in which each of the following environmental factors influence crop production.
  - i) Temperature (4 marks)
  - ii) Wind (5 marks)
- 23.

24. a) Define profit and loss account

b) The following is a list of financial and position of Mr. Ndama's farm in 2010. Study the information carefully and then answer the questions that follow:

| <b>Items</b>               | <b>value</b> |
|----------------------------|--------------|
| Sale of diary cattle       | 28,000.00    |
| Closing valuation          | 25,000.00    |
| Purchase of fertilizer     | 6,000.00     |
| Interest payable           | 2,000.00     |
| Milk sale                  | 3,000.00     |
| Veterinary bills           | 900.00       |
| Wages                      | 1,600.00     |
| Opening evaluation         | 4,800.00     |
| Sales of pigs              | 8,000.00     |
| Purchase of assorted tools | 3,560.00     |
| Depreciation of machines   | 720.00       |
| Repair of pigsty           | 370.00       |

i) Prepare a profit and loss account for Mr. Ndama's farm.

ii) Calculate the percentage profit and loss of Mr. Ndama's firm.

**GEM SUB-COUNTY JOINT EVALUATION****443/2****AGRICULTURE****PAPER 2****SECTION A: (30 Marks)***Answer all the questions in this section in the spaces provided*

1. Give four reasons why colostrum should be fed to calf. (2 marks)
2. State three disadvantages of natural methods of calf rearing. (1½ marks)
3. Name five milking materials and equipment required during milking of a cow. (2½ marks)
4. State the functions of a carburetor in fuel system. (1 mark)
5. State the functions of the following parts of a disc plough. (2½ marks)
  - i) The beam
  - ii) Disc
  - iii) Scrapers
  - iv) Standards
  - v) Furrow wheel
6. Give two notifiable diseases in cattle. (1 mark)
7. State four factors that determine the quality of honey. (2 marks)
8. State four practices carried out on fish before preservation. (2 marks)
9. Give four properties of a good vaccine. (2 marks)
10. Define predisposing factors as used in livestock. (1 mark)
11. State four predisposing factors that can lead to cow contracting mastitis. (2 marks)
12. State four reasons for handling livestock in the farm. (2 marks)
13. Differentiate between the following livestock breed terms. (2 marks)
  - i) Bull and bullock
  - ii) Ram and ewe
14. Name two meat breeds of sheep reared in Kenya today. (1 mark)
15. Identify the colour of the following breeds of poultry. (1 mark)
  - i) Light Sussex
  - ii) New Hampshire
16. Name two dual purpose breeds of cattle. (1 mark)
17. State three precautions observed when using workshop tool and equipment. (1½ marks)
18. State four signs of parturition shown by a sow. (2 marks)

**SECTION B: (20 MARKS)***Answer all the questions in this section in the space provided.*

19. a) Using Pearson square, calculate how much of wheat (35% DCP) would be mixed with sunflower seed cake (10% DCP) to come up with Duck mash (20% DCP) on a ration weighing 100kg. (2 marks)
- b) Below is a diagram of a cow suffering from a nutritional deficiency diseases. Study it and answer the question below.
  - i) Identify the disease the animal is suffering from. (½ mark)
  - ii) List two symptoms shown by a cow suffering from the disease mentioned in b (i) above. (1 mark)
  - iii) Name the mineral deficient that cause the above disease. (½ mark)
  - iv) State the two control measures of the disease mentioned above. (1 mark)
20. Study the tools below and answer the questions below.
  - a) Identify the tools X,Z and W (1½ marks)
  - b) What are the functions of tools W and X (2 marks)
21. The diagram below shows a practice carried out in poultry.
  - i) Name the practice above. (½ mark)
  - ii) Identify the diagram that shows the correct method of carrying out the practice mentioned in (i) above. (½ mark)
  - iii) Name two tools used to carry out the practice above. (1 mark)
  - iv) Give two reasons for carrying out the practice shown above. (1 mark)
22. The diagram below shows power transmission system of a tractor. Study it and answer the questions that follow.
  - a) Name parts labeled A , B, C and D (4 marks)
  - b) State three maintenance practice of sprayers. (1½mks)
23. The illustration below represents an equipment used in poultry production. Study it and answer the questions that follow.



- 
- i) Identify the equipment (1 mark)
  - ii) Identify the parts labeled C , D (1 mark)
  - iii) Why is it important to turn the eggs 1800 every 6-8 hours within the equipment. (1 mark)

**SECTION C: (40 MARKS)**

*Answer any two questions in this section.*

- 24. a) Highlight four advantages of deep litter system. (4 marks)
- b) State four ways in which stress can be controlled in poultry management. (4 marks)
- c) Outline five disadvantages of animal-drawn implements over tractor-drawn implements. (5 marks)
- d) i) Sate three characteristics of a poor layer. (3 marks)
- ii) Outline four advantages of artificial insemination in cattle management. (4 marks)
- 25. a) i) Distinguish between close breeding and line breeding. (3 marks)
- ii) Give three reasons for out breeding as used in livestock production. (10 marks)
- b) Describe the function of various parts of a plunge dip. (5 marks)
- c) Sate five disadvantages of live fences. (3 marks)
- 26. a) Describe coccidiosis under the following sub heading. (1 mark)
- i) Causal organism (5 mark)
- ii) Signs of infection (4 mark)
- iii) Control measures (7 marks)
- b) Describe lifecycle of three host tick. (3 marks)
- Describe how a calf is trained to drink milk from the bucket.

**GEM SUB-COUNTY JOINT EVALUATION****443/1****AGRICULTURE****PAPER 1****Marking scheme**

1. -Communal land ownership
  - Large piece of land
  - Sparse population **3 points × ½ = 1½ mark**
2. -Clearing vegetation
  - Digging out soil from the selected spots I
  - Mixing the dug out soil
  - Breaking large lumps of the soil into small pieces
  - Drying the soil
  - Quaterning the sample **4 points × ½ = 2 marks**
3. - When opening up virgin land
  - Where a stalk growing crop was previously planted.
  - Where the interval between primary and secondary cultivation is long.
  - Where the land was left fallow for a long time. **4 points × ½ = 2 marks**
4. - Nitrogen fixation by lightning.
  - Nitrogen fixation by nitrogen fixing bacteria
  - Nitrification
  - The harber
  - Borsch process. **3 × ½ = 1½ marks**
5. -No disturbance of root system at transplanting
  - Can be transported for long distances without damage
  - Seedlings grow very fast
  - It is possible to plan when to transplant
  - Problems of soil-borne pests and diseases can be avoided **4 points × ½ = 2 marks**
6. -Inefficient management of the farm business
  - Poor record keeping
  - Poor use of agro chemicals
  - Poor marketing
  - Poor adoption of new farming activities **4 points × ½ = 2 marks**
7. -Unblocking of blocked nozzles/holes on pipes
  - Flushing with phosphoric acid to dissolve deposit of salts
  - Replace the broken pipes **2 pts × ½ = 1 mark**
8. -To show the health conditions of the animals
  - For use in selection and culling of animals
  - Help to trace the history of diseases for better treatment
  - Shows the costs of treating the diseases for assessing profitability of animals. **4 points × ½ = 2 marks**
9. -Stage of growth of the weed plant
  - Plant morphology and autonomy
  - Psychological/metabolic factors
  - Herbicides characteristics
  - Concentration of herbicides
  - Method of application.
  - Weather conditions. **4 points × ½ = 2 marks`**
10. -medicant for treating disease.
  - hormones for improving growth rate
  - Antibiotics to treat diseases
  - To improve palatability.
11. -Avoid picking during wet season
  - Do not use sisal bags
- 12.-Improves water infiltration
  - improve root penetration
  - improves soil aeration
  - bring leached nutrients to the surface.

13. -Bacterial (Hall) blight.

-Bean Anthracnose.

14. a) Oversewing is the introduction of a pasture legume in an existing grass pasture.

-Undersowing is the establishment of a pasture under a cover crop

$$b) \quad \text{Plant population} = \frac{\text{Area of land}}{\text{spacing}}$$

$$= \frac{400 \times 400}{75 \times 25} = 85 \text{ plants}$$

15. -friends

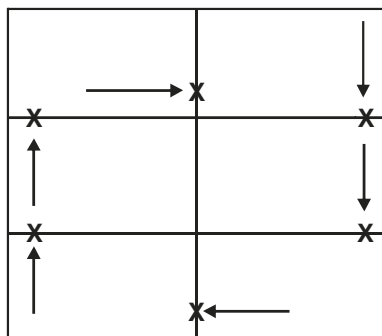
- private money lenders
- Commercial banks
- Cooperatives
- private organisation

16. weeding

- top-dressing
- topping
- re-seeding
- irrigation
- pest and disease control
- controlled grazing.

17.a) Paddocking - *Rej* Rotational grazing.

b)-



-Two correct arrows (1;2 mk)

-All correct arrows (1 mk)

c) -It is watering point for animals (1 x 1 mark= 1 mark)

(d) -Livestock make maximum use of pastures

-Reduces the build up of parasites and diseases

-Animal waste is distributed evenly in all fields of paddocks

-Pasture crop is given time to re-grow before it is grazed on again

-Excess pasture can be harvested for conservation

-Possible to carry out management practices such as topping, weed control and fertilizer application in parts of the pasture which are not in use

2ptsx 1/2 mk= 1 mark

18(a) A-Gutter 1;2 mk

O - overflow pipe 1;2 mk Total 1 mark

(b) Roof catchment 1/2 x 1 point =1/2 mark

c) -To remove sediments and solid dirt 1/2 x 1 point = 1/2 mark

(d) -Painting

-Repair if leaking/welding

19(a) -Severe dwarfness

- Increased tillering

(b) -Planting resistant varieties

-Use of certified seeds

-Field hygiene

-Crop rotation

20a) (i) A - Stem cutting (1 mk)

B- Stem Tuber (1 mk)

ii) X - bud. (1mk)

- Y - Shoots/sprouts (1 mk)  
 iii) Chitting/prouting (1 mk)

**b)**

- (i) Vegetative propagation does not result in new crop varieties.  
 (ii) Keeping the materials free of disease is difficult.  
 (iii) Materials can not be stored for long.  
 (iv) Materials are bulky and so difficult to store and transport.  $1 \times 3 = 3 \text{ mks}$

## **SECTION C**

**21.**

**a) Practices carried out to control crop disease.**

-Crop rotation, help to break the life cycles of disease - causing organisms.

- Roguing/Destroying infected crop; stops the diseases from spreading.
- Planting disease free plants/use of certified seeds; planting clean material prevents introduction of pathogens into the field.
- Closed season; helps to break life cycles of pathogens.
- Early planting/Timely planting; helps the crop to establish faster before attack.
- Proper spacing; creates an unfavourable micro-climate for some pathogens/prevents spread.
- Weed control; prevents harbouring of some pathogens.
- Use of resistant varieties; prevents attack by pathogens.
- Application of appropriate chemicals; kills the pathogens.
- Use of clean equipment; reduces the chances of contamination with disease - causing organisms.
- Quarantine; prevents introduction of pathogens into the farm.
- Heat treatment; kills micro organisms.
- Pruning; creates unfavourable micro climate for some pathogens/removes affected parts and stop spread.
- Destruction of crop residue; kill pathogens/stop spread.
- Control of vectors; stop spreading of pathogens
- Proper nutrition; plants withstand disease/control/deficiency diseases.

*Award ½ mk for identify practice*

*Award 1 mk for appropriate explanation*

*(1½ x 8 = 12mks)*

**b) Advantages of grass -legume pasture.**

- Its more palatable than pure grass;
- Farmer has security against total loss due to attack by pests, diseases or bad weather;
- Mixed pasture yields higher per unit area of land;
- Its more nutritious/has a higher nutritional value;
- Mixed pasture makes maximum use of soil nutrients because of different nutrient requirement.
- Has better weed control effect;
- Increases soil fertility because of Nitrogen fixation;
- Reduces soil erosion because of good soil coverage;
- There is economy in the use of fertilizers;
- There is better seasonal distribution of growth i.e. a mixture of early and late maturing species can be included in the mixture.  $1 \times 8 = 8 \text{ mks}$

**22. Establishment kales**

**a) i) establishment of the nursery.**

- Make shallow drills/furrows about 15 cm apart.
- Apply phosphatic fertilizer in the drills and mix with soil.
- Sew seeds by drilling.
- Cover the seeds lightly with soil.
- Apply thin layer of mulch after sewing seeds.
- Water the nursery thoroughly.

**ii) Transplanting of seedlings.**

- At onset of rain / moist soil.
- Holes are made 15cm deep at a spacing of 90cm × 60cm or (60 × 60cm)
- Add rotten manure and DSP in holes.
- Water nursery well.
- Lift seedlings when (4 - 6 wks only/ 15cm tall) using a garden trowel.

- Place seedlings in the holes.
  - Firm the soil around the base.
  - water and mulch the seedlings.
- b) i) Temperature
- Affect rate of germination.
  - Affect quality of plant produce
  - Affect rate of photosynthesis / growth.
  - Affect distribution and performance of crops.
  - Determines the rate of evapo-transpiration
  - inferences incidences of pest and diseases on crops and livestock.
- ii) Wind
- Increases rate of evapo-transpiration
  - Strong winds causes destruction and lodging of crops.
  - causes soil erosion.
  - influences rain formation.
  - Increases spread of wind, pests / diseases.
  - regulates environmental temperatures.
  - Draught cases stress in livestock
  - influences pollination.

**23.**

a) - Profit and loss account is a financial statement that shows the difference between sales plus closing valuation less total purchases plus opening valuation.

b) i)

Profit and loss account - for Mr. Adam's farm for the year ended 2010

| Purchase and expenses      |              |           | Sales and receipts |              |           |
|----------------------------|--------------|-----------|--------------------|--------------|-----------|
|                            | Shs          | Cts       |                    | Shs          | Cts       |
| Opening valuation          | 4800         | 00        | Cattle             | 38,000       | 00        |
| Purchases of fertilizers   | 6000         | 00        | Milk sales         | 3,600        | 00        |
| Interest payable           | 2000         | 00        | Sale of pigs       | 8,000        | 00        |
| Veterinary bills           | 9000         | 00        | Closing valuations | 5,000        | 00        |
| Wages                      | 1600         | 00        | Total              | 64,600       | 00        |
| Depreciation of machine    | 720          | 00        |                    |              |           |
| Purchase of asserted tools | 3560         | 00        |                    |              |           |
| Repair of pigsty           | 370          | 00        |                    |              |           |
| Total                      | 19950        | 00        |                    |              |           |
| Profit                     | 44650        | 00        |                    |              |           |
|                            | <u>64650</u> | <u>00</u> |                    | <u>64650</u> | <u>00</u> |

*Each correct entry ½ mk (13 x ½ = 6 ½ mks)*

ii) Percentage profit.

$$\frac{\text{Total sales and receipts} - \text{Total purchase expense} \times 100}{\text{Total cost of expense}}$$

$$= \frac{44,650}{64,650} \times 100 = 69.12\%$$

$$= 69\%$$

**GEM SUB-COUNTY JOINT EVALUATION****443/2****AGRICULTURE****PAPER 2****MARKING SCHEME****SECTION A (30 marks)**

1. 4 reasons why colostrum should be fed to a calf.  
 Highly digestible;  
 Highly nutritious and contains vitamins for growth and disease resistance;  
 Has antibodies that enable the calf resist early disease infection;  
 Cleans the bowels of the calf (has laxative effect);  
 Highly palatable;  $4 \times \frac{1}{2} \text{ mark} = 2 \text{ marks}$   
*Mark the 1st four only*
2. 3 disadvantages of natural method of calf rearing  
 Calf is underfed as the farmer removes all the milk from the udder (or calf is overfed as it suckles too much milk resulting in scours);  
 Cows may not let down milk in absence of the calf;  
 It is difficult to keep accurate records of milk yield;  $3 \times \frac{1}{2} \text{ mark} = 1\frac{1}{2} \text{ marks}$   
*Mark the 1st three only*
3. 5 milking materials and equipment  
 Udder clothes / towels;  
 Filtering pads;  
 Milking jelly;  
 Warm water;  
 Milking pails / buckets;  
 Strip cup;  
 Milk cans / churns;  $5 \times \frac{1}{2} = 2\frac{1}{2} \text{ marks}$   
*mark the 1st five only*
4. Functions of a carburettor in fuel system  
 - Turns liquid petrol into vapour and mixes it with define amount of air;  $1 \times 1 = 1 \text{ mark}$
5. Function of the following parts of a disc  
 i) Beam;  
 - Provides attachment for all other parts of the plough;  
 ii) Disc;  
 - Cut, turn and invert furrow slices;  
 iii) Scrappers;  
 - Remove wet soil from the disc/ AIDs in turning and inverting the furrow slice;  
 v) Furrow wheel;  
 - Rides over dead furrows counteracting thrust hence balancing the whole implement /  
 Adjust the depth of ploughing.  $5 \times \frac{1}{2} \text{ mark} = 2\frac{1}{2} \text{ marks}$
6. 2 Notifiable diseases in cattle  
 Anthrax  
 Contagious abortion / accept Brucellosis / Bang's disease;  
 Pneumonia  
 Rinderpest  $2 \times \frac{1}{2} = 1 \text{ mark}$   
*Mark 1st two only*
7. Factors that determine the quality of honey  
 Type of plant from which the nectar was obtained;  
 Maturity stage of honey at the time of harvesting  
 Method of harvesting;  
 Method of processing honey  $4 \times \frac{1}{2} \text{ mark} = 2 \text{ marks}$   
*Mark 1st four only*
8. 4 practices carried out on fish before preservation  
 Cleaning the fish to remove mud and any worms;  
 Removing scales and slims  
 Opening the fish on the side to remove gut and intestines / gutting  
 Cleaning the abdominal cavity thoroughly..  
 Keeping fish in open containers.  $4 \times \frac{1}{2} = 2 \text{ marks}$

**9. 4 properties of a good vaccine**

Immunity it produces should be as good as natural immunity

Should have long keeping life / long shelf life.

Should be easy to administer to the animal

Should have no side effects when innoculated.

Should be compatible with other vaccines given to the animal;

A single dose should produce life long immunity.  $4 \times \frac{1}{2} = 2 \text{ marks}$

**mark 1st four only**

**10. Predisposing factor**

- Are those conditions inside or outside the body of an animal which lead to the animal contracting a disease or injury.  $1 \times 1 \text{ mark} = 1 \text{ mark}$

**11. Four predisposing factors that can lead to cow contracting mastitis.**

Age

Stage of lactation

Udder attachment

Incomplete milking

Mechanical injuries

Poor sanitation

Poor milking technique  $4 \times \frac{1}{2} = 2 \text{ marks}$

**12. Four reasons for handling livestock in the farm**

When inspecting the animal to a certain abnormality or signs of disease;

When administering any form of treatment to the animal;

When spraying or hand dressing the animal with chemicals to control external parasites

When milking the animal

When performing some management practices like dehorning, disbudding, castration, hoof trimming.

$4 \times \frac{1}{2} = 2 \text{ marks}$

**Mark 1st four only**

**13. Differentiate**

i) Bull and bullock

A bull is a mature male cattle while a bullock is a mature castrated male cattle;

$1 \times 1 = 1 \text{ mark}$

ii) Ram and Ewe

A ram is a mature male sheep while an ewe is a mature female sheep;

$1 \times 1 = 1 \text{ mark}$

**14. 2 meat breeds of sheep**

- Dorper

- Blackhead Persian

- Red Maasai sheep  $2 \times \frac{1}{2} = 1 \text{ mark}$

**Mark the 1st two only**

**15. Breed**

Colour

i) Light sussex White  $1 \times \frac{1}{2} = \frac{1}{2} \text{mk}$

ii) New hampshire Light red  $1 \times \frac{1}{2} = \frac{1}{2} \text{mk}$

**16. 2 Dual purpose breeds of cattle**

- Sahiwal

- Red poll

- Simmental  $2 \times \frac{1}{2} = 1 \text{ mark}$

**Mark the 1st two only**

**17. 3 precautions observed when using workshop tools and equipment**

- Tools should be left in a safe place after use.

- Use the correct tool for the correct job

- Tools should be maintained and serviced

- tools should be handled correctly when in use.

- Use of safety devices e.g. fire extinguishers, goggles etc.  $3 \times \frac{1}{2} \text{ mark} = 1\frac{1}{2} \text{ mark}$

**Mark 1st three only**

**18. 4 signs of parturition shown by a sow**

- Restlessness

- Vulva turns red and swells.

- Udder becomes fully with a milky fluid.

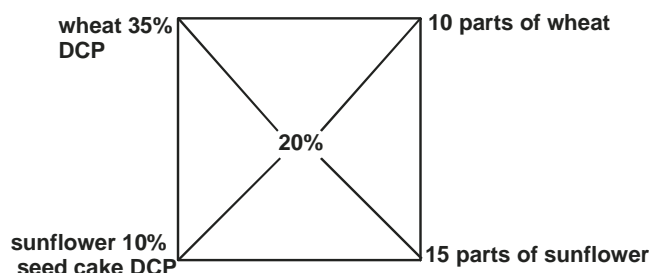
- Sow starts to build a nest by collecting some bedding at one corner of the pen.

$4 \times \frac{1}{2} \text{ marks} = 2 \text{ marks}$

**Mark 1st four only**

**SECTION B (20 marks)**

19.



*Award ½ mark for correctly drawn and labelled square*

*½ mark × 4 = 2 marks*

b) i) Milk fever / parturient paresis / Hypocalcaemia *½ mark*

ii)

Muscular twitching causing the animal to tremble.

Staggering as the animal is moving.

Inability to stand thus animal lies down on the side most of the time.

Dull eyes and dilated pupils

Animal falls down and becomes unconscious.

Body functions such as urination, defecation and milk secretion stops.

Sudden death if the animal is not treated immediately.

Stomach contents are drawn into the mouth which later cause lung fever when breathing in.

Complete loss of appetite *2 × ½ mark = 1 mark*

*Mark 1st two only*

iii) - Calcium

*1 × ½ = ½ mark*

iv)

Give the animal intravenous injection of soluble calcium salt in form of calcium borogluconate.

Partial milking of the cow with past history of the disease.

Feed the animal on diet rich in calcium during pregnancy and lactation.

Susceptible / affected animals should be culled and kept in comfortable condition. *2 × ½ = 1 mark*

*Mark 1st two only*

20. a) X - spirit level

Z - try-square / mason's square

W - cold chisel. *3 × ½ mark = 1½ marks*

b) Functions of :

W - cutting thick sweets of metal.

X - checking whether a surface is vertical or horizontal. *2 × 1 = 2 marks*

21. i) - Debeaking (*½ mark*)

ii) C *½ mark*

iii) - Debeaker

- knife

- Scissors

- Hot iron

*2 × ½ mark = 1 mark*

*Mark the 1st two only*

iv) - To control egg-eating

- To control cannibalism *2 × ½ mark = 1 mark*

22. a) A - Differential

B - Gear box

C - Fly wheel

D - Propeller shaft *4 × 1 mark = 4 marks*

b) Maintenance practices on sprayers

- Tank should be drained before and after use.

- All nozzles should be removed and cleaned when blocked.

- Tank and other parts should be washed thoroughly with clean water and dried.

- Parts prone to rusting of should be cleaned and painted. *3 × ½ = 1½ marks*

*Mark 1st three only*



23. i) Artificial incubator  $1 \times 1 = 1 \text{ mark}$   
**Rej. Incubator alone**
- ii) C - thermometer  
 D - water bath / warm water.  $2 \times \frac{1}{2} \text{ mark} = 1 \text{ mark}$
- iii) To ensure even distribution of warmth hence facilitate even chick development  $1 \times 1 \text{ mark} = 1 \text{ mark}$

## 24.a)

- Incidence of cannibalism, egg eating, teacher plucking are common.
  - There is a likelihood of pests of disease accumulation in bitter.
  - An individual record of e.g. production per bird is not possible hence not easy to know layers.
  - Litter may be difficult to find in some areas.
  - Eggs may become dirty especially when laid on the ground.
  - Feeders and waterers may be contaminated  $1 \times 4$
- b)- Keep the poultry house quiet by buildings if away from the road, where people and vehicles pass.
- Insulate the poultry house to maintain uniform temperature;
  - Control diseases and parasites.
  - Change of routine programmed must be grown.
  - Provide enough feeds and water.  $1 \times 4$
- c)- They are more tedious than tractor-drawn implements has to keep on guiding the animal and the implement.
- More than one person is required to guide the plough and the animal.
  - Animal drawn implements are slower turn tractor drawn implement.
  - Animals get tired at times, hence work is slow.
  - There are diseases in some areas which makes it difficult to use animals.
  - A farmer needs to set aside a piece of land where he either grows toddler crop.
- d) i)
- Combs and wattles are such, dry and cold.
  - Vent is small, round and pigmented;
  - The space between pelvic bones is narrow.
  - Plumage is usually shiny, wear presented or sometimes moulting.
  - Yellowish pigmentation is common in the vent, beak sharp.  $1 \times 4$
- ii)
- Semen of superior bull can be used to serve many cows.
  - Controls transmission of breeding diseases and parasites.
  - Gives that are heavy can produce semen to serve cows.
  - Prevents large bulls from injuring small cows.
  - Reduce expenses of keeping bulls on pastures.  $1 \times 4 = 4 \text{ marks}$

## 25.

- a) i) Close breeding - It breeding of very close related animals.
- Line breeding - This the mating of distantly related animals that share a common ancestor - such as cousins with cousins.  $1 \times 2$
- ii)
- To introduce new genes in an existing breeding herd.
  - To exploit heterosis that is hybrid vigour.
  - To establish a new breed.  $1 \times 3$
- b)- Animal holding - used to hold animals before dipping.
- Foot path - To wash the feet of the animal before they get into dip wash.
  - The jump - allows the animals to jump singly into dip tank
  - Dip tank - contains acaricide solution for controlling ticks.
  - Drowning race - The dip wash from the animal's body drip off and drains back to the dip tank.
  - Drying yard. - where the animals are held to dry before being released to pasture. (this prevents pastures contamination)
  - Silt trap outlet.- prevents siltation.
  - Dip tank south - prevent evaporation of the dip wash
  - Also avoid dilution of the dip wash by the rain water.
  - also serves as a roof catchment for collecting rain water to the tank.
  - Water tank./ Reservoir tank - used for storing water either from the roof or any other area.
  - Waste pit - used as a dumping site for sediments from the dip tank. **Mentioning -  $\frac{1}{2}$  mark**  
**Explanation -  $\frac{1}{2}$  mark**  
 $1 \times 10$

**d)-** They take many years to grow and make effective fence

- They cannot be used for paddocking.
- Hedges can be hiding out for rodents.
- Thorny species can cause injury to humans.
- Require regular trimming.
- Their growth may be irregular thus gates for thieves.

**26.a)**

i) *Coccidia* / *Eimeria* spp.     **1 × 1**

- ii) - Diameter
- Dysentery / blood in dung
  - Emaciation
  - Ruffled feathers
  - Dullness with drooping wings.
  - Sudden death.     **1 × 5**

iii)

- Use coccidiostats. (drug)
- Isolation / use of potable calf pen.
- Avoid, wet, filthy and unhygienic animal surroundings.
- Cattle from different farms should not drink in common watering points.
- Avoid overcrowding.     **1 × 4**

**b)** Eggs hatch on the ground and larvae emerge; emerging larvae attach themselves to the first host ;     feed on blood ;     become engorged; drop off to the ground ; and moult into nymphs ;

These nymphs seek out a second host; feed on blood ; become engorged ;     and drop off to the ground and moult into adults ;     The adults climb onto the third host ;     they feed ;     become engorged ;     and mate; before the females drop off to the ground to lay eggs. ;

**c)-** put clean milk in clean bucket.

- Clean your hands.
- Place the index finger into the calf mouth, the calf starts sucking.
- Lower the finger slowly until it is submerged in milk as the calf sucks, this allows the calf to drink milk.
- Slowly withdraw the finger while the calf is sucking.
- Repeat the whole procedure daily and continuously.  $\frac{1}{2} \times 6 = 3$  marks

**KMT JOINT EVALUATION - 2015**

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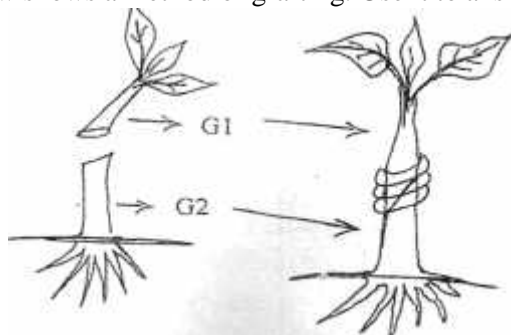
**AGRICULTURE****PAPER 1****JULY/ AUGUST 2015****TIME: 2 HOURS****SECTION A (30 marks)****Answer ALL the questions in this section in the spaces provided**

1. What four disadvantages are associated with burning of land in shifting cultivation? [2mks]
2. Which four soil properties are influenced by soil texture? [2mks]
3. Outline **four** characteristics researchers aim at developing in breeding of maize crop. [2mks]
4. State **three** ways on how a farmer prevents loss of soil fertility. [1 ½ mks]
5. What is changing cycle as used in coffee production? [1 mk]
6. Give **two** methods used for seed-treatment of tree species before planting in agroforestry. [2mks]
7. Outline **two** properties of Potassic fertilizers [1 mk]
8. State **two** roles of water in a field of paddy rice [1 mk]
9. Outline four factors that would influence the depth of tillage in a seed bed for growing ewe
10. A farmer has the option of growing either wheat or maize in his one hectare of land. Wheat gives a return of Ksh. 20,000 while maize fetches Ksh. 35,000 in the market.  
What will be the opportunity cost? [1mk]
11. Mention **four** factors that determine the carrying capacity of a pasture [2 mks]
12. State **four** distinctive features of monopolistic competition
13. Calculate the amount of K<sub>2</sub>O that is contained in 400kg of a compound fertilizer 25:10:; (Show your working) [1mk]
14. State **four** factors that determine the stage at which a crop is harvested [2mks]
15. State three advantages of non-capped multiple stem system. [1 ½ mks]
16. Outline four problems associated with farm yard manure [2 mks]
17. Name two main ways in which pastures are classified. (1 mark)
18. Outline two examples of joint products in crop production (1mark)
19. State two roles of water in a field of paddy rice (1 mark)

**SECTION B (30 marks)****Answer ALL the questions in this section in the spaces provided**

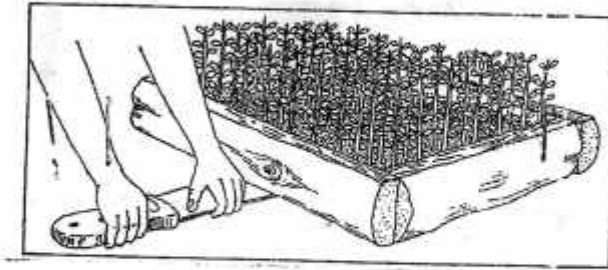
20. (a) Design rotation programme of two seasons using the following crops; Maize, garden peas, kales and Irish potatoes. (2 marks)

- (b) The illustration below shows a method of grafting. Use it to answer the following questions.

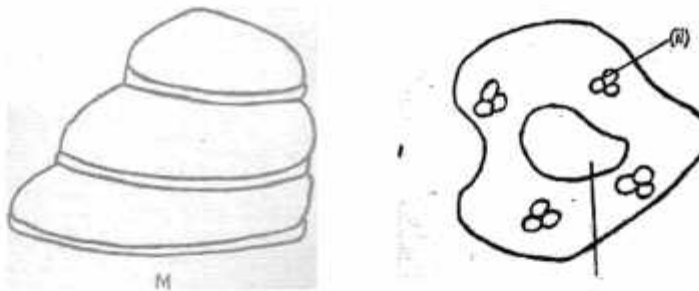


- (i) Identify the type of grafting. (1/2 mark)
- (ii) Name the parts named G1 and G2. (1 mk)
- (iii) List down three equipment / tools used to carry out the above type of grafting. (1 ½ mks)

21. (a) The diagram below illustrates a management practice carried out on tree seedlings

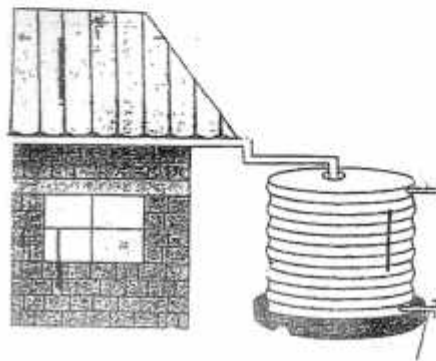


- i) Identify the management practice carried out illustrated above. (1 mk)  
 ii) State two other management practices carried on tree seedlings (2mks)  
 b) The diagram below illustrates some types of soil structure. Study and answer the questions that follow.



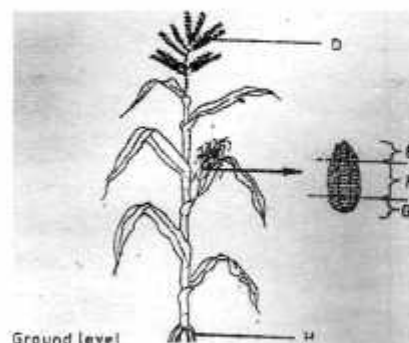
- i) Identify the types of soil structure illustrated in the diagrams M and N [1 mk]  
 ii) Name the parts labeled (i) and (ii) in the diagram [1 mk]

22. The diagram below shows a structure used in collecting water in the farm



- i) Identify the method of collection above (1 mk)  
 ii) Give two factors that will determine the amount of water collected in the above mentioned structure (1 mk)  
 iii) Outline two maintenance practice that should be carried out on part labeled C above [1 mk]  
 iv) Name two other method used in collecting water in the farm. [1 mk]

23. The diagram below illustrates a cereal crop plant and its produce, study the diagram carefully and answer the question that follows.



- a) Name one disease that attack the part labeled D in the diagram [1mk]
- b) From which section of the produce labeled E. F and G should seed for planting be obtained (1/2 mk)
- c) Give one reason for the answer given in (b) above. [1 mk]
- d) State two functions of the part labeled H in the diagram [1mk]
- e) A farmer has a piece of land measuring 90m by 60m to plant seeds selected in (b) above at the rate of one seed per hole and spacing of 90cm by 30cm, calculate the plant population in the whole field if ail the seeds germinated (Show your working) (1 ½ mks)

### SECTION C (40 MARKS)

Answer any two questions front this section in the spaces provided after the question.

24. (a) Outline five steps followed in land adjudication. (5 marks)
- (b) Explain five physical structures used to control soil erosion. (10 marks)
- (c) Give five principals that govern the functioning of co-operatives. (5 marks)
25. Describe beans (*phaseolus vulgaris*) under the following sub-headings.
- (a) Ecological requirements. (4 marks)
- (b) Varieties (4 marks)
- (c) Seedbed preparation (8 marks)
- (d) Pests and diseases control. (4 marks)
26. (a) The Kipkunur enterprise obtained a loan of Kshs.30, 000 to repair Lorries and tractors. It had a bank overdraft of Kshs. 4,000. The enterprise is yet to pay Kshs. 4,000 as wages for casual workers and Kshs. 600 as interest on a loan.
- The following were also found in the premises of the enterprise. Remains of seeds and fertilizers worth Kshs. 400; building and land valued at Kshs. 30,000 and Kshs. 6,000 respectively; Coffee trees worth Kshs. 4,000, tractor Kshs. 20,000, 2 heifers worth Kshs. 14,000 and one calf Kshs. 600.
- Debtors of Kipkunur enterprise are coffee board Kshs. 3,649.50. The bank account has 9,950 and Kshs. 5,000.50 in the cash box in the enterprise office.
- Using the above information prepare a balance sheet for Kipkunur enterprise for the year ending 30th June 2011. (6 mks)
- (b) (i) What is a balance sheet? (2 mks)
- (ii) Was Kipkunur enterprise solvent or insolvent? Give a reason to your answer. (2 mks)
- (c) Explain **five** ways in which labour productivity can be improved in farm. (10 marks)

**KMT JOINT EVALUATION - 2015**

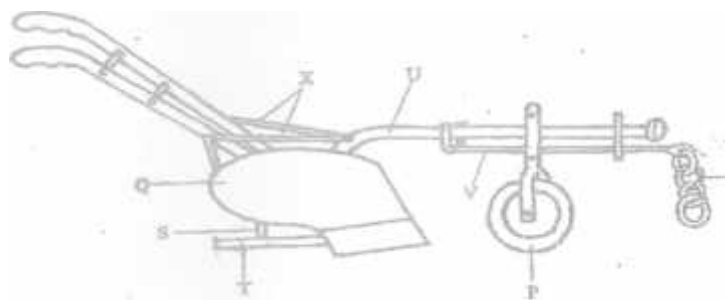
443/2

**AGRICULTURE****PAPER 2****JULY / AUGUST 2015****TIME: 2 HOURS****SECTION A: (30 MARKS)***Answer all the questions in this section in the spaces provided*

1. Name any two tractors drawn implements with three-point hitched. [1 mk]
2. Name two methods of identifying piglets in the farm. [1 mk]
3. (a) State four symptoms of shown by poultry when suffering from Newcastle disease [2 mks]  
(b) Give the name of the organism that causes East Coast Fever. [2 mks]
4. State four desirable characteristics of egg meant for market. [2mks]
5. Give **four** effects of ticks on livestock bodies. [2mks]
6. Give **two** features that enable the gizzard to carry out its functions effectively. [1mk]
7. State **three** functions of a differential in a tractor. [2mks]
8. State **one** use of the following tools: - [1 ½ mks]
  - (a) Spoke shave
  - (b) Stock and die
  - (c) Wire strainer
9. List four causes of sterility in dairy cows. [2mks]
10. State **four** factors which influence selection of construction materials. [1 ½ mks]
11. State **four** practices that should be carried out on a fish pond after draining it. [2mks]
12. State **three** reasons for spreading polythene paper in the slab of the farm building. [2mks]
13. State **four** uses of solar energy in the farm. [1 ½ mks]
14. Name **four** tools that can be used to construct the Kenya Top Bar Hive. [2mks]
15. State **four** physiological body processes used as indicators of ill health. [2mks]
16. List **four** functions of lubrication systems. [2mks]
17. State four ways of stimulating milk let down in a dairy cow [2mks]

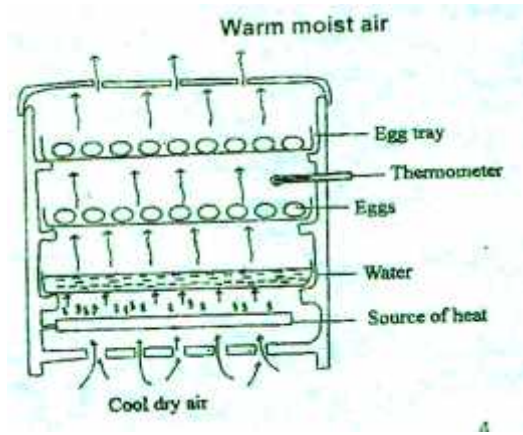
**SECTION B: (20 MARKS)***Answer all the questions in this section in the spaces provided.*

18. Use the diagram below to answer the questions that follow.



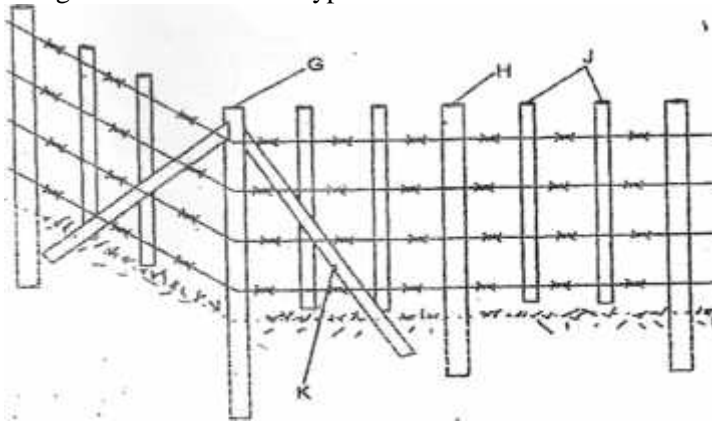
- a) Identify the implement. [1 mk]
- b) Identify the parts labeled S, V, W, and X. [2 mks]
- c) What is the use of the following parts? [2 mks]

19. Below is a structure used in poultry reproduction?



- a) Identify the structure. [1mk]
- b) State the main function of the structure. [1mk]
- c) Give the function of the following in the structure:- [3 mks]
  - i) Water
  - ii) Source of heat
  - iii) Thermometer

20. The diagram below shows a type of a fence found in a farm. Use it to answer the questions that follow;



- a) Identify the above type of fence.
- b) Name the parts labeled G, H, J and K.
- c) State one use of part labeled J in a fence.
- d) State the appropriate hole depth for posts labeled G and H.

21. The illustration below represents the stages of development of a three-host tick. Study it carefully and then answer the questions that follow.



- a) Briefly explain what is happening in the following stages:- (2mks)
- b) Name the most common sites the tick can be found on the body of an animal. (2mks)
- c) Give two examples of a three-host tick. (1mk)

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**SECTION C: 40 MARKS**

**Answer any two questions in this section in the spaces provided.**

22. a) State **four** possible causes of overheating in an engine.  
b) Describe the maintenance practices to be carried out in a cooling system of a tractor.
23. a) State **three** advantages of using a donkey for farm work.  
b) Describe the procedure of establishing a permanent foundation using concrete.  
c) Describe the characteristics of a good calf pen.
24. a) What are disease predisposing factors?  
b) State **five** diseases predisposing factors in livestock  
c) State **five** predisposing factors of mastitis in dairy cattle.  
d) Explain any **four** general methods of disease control in livestock.



**KMT SECONDARY SCHOOLS EXAMINATIONS 2015**

443/2 –

**AGRICULTURE****PAPER 2****MARKING SCHEME****SECTION A: (30 MARKS)**

1. Name any two tractors drawn implements with three-point hitched. (1mk)
  - Disc plough, Mouldboard plough, Mowers, some sprayers. (2 x ½ = 2 mks)
2. Name two methods of identifying piglets in the farm. (1mk)
  - Ear notching
  - Ear tattooing
  - Ear tagging (2 x ½ = 1 mk)
3. a) State four symptoms of shown by poultry when suffering from Newcastle disease. (2mks)
  - Difficulty in breathing
  - Loss of appetite/Anorexia
  - Paralysis/staggering motion
  - Yellowish/watery diarrhoea
  - Drop in production
  - Bending of neck
  - Production of soft shelled eggs
  - Dropping wings (4 x ½ = 2 mks)
- b) Give the name of the organism that causes East Coast Fever. (½mk)
  - Theilaria parva (1 x ½ = ½ mk)
4. State four desirable characteristics of egg meant for market. (2mks)
  - Medium size
  - Brown shelled in colour
  - Smooth shelled texture
  - Oval in shape
  - Clean (4 x ½ = 2 mks)
5. Give four effects of ticks on livestock bodies. (2mks)
  - Wounds on the skin/hides opening routes for infection.
  - Sick blood causing anaemia.
  - Irritation on livestock bodies.
  - - Transmit disease (4 x ½ = 2 mks)
6. Give two features that enable the gizzard to carry out its functions effectively. (1mk)
  - Has thick muscles that rotate
  - Contain small stone/gut
  - - Has folds/ridges in inner layer (4 x ½ = 2 mks)
7. State three functions of a differential in a tractor. (1½mks)
  - Transmission or power from the drive shaft to the rear wheel through axle.
  - Moderates/Adjust the motion speed as opposed to engine speed.
  - - Enables rear wheels to rotate independently. (3 x ½ = 1½ mks)
8. State one use of the following tools: - (1½mks)
  - a) Spoke shape
    - Smoothing/planning off concave curved edges
  - b) Stock and die
    - Cutting threads in pipes
    - Wire strainer
    - Tightening wire during fencing (3 x ½ = 1½ mks)
9. List four causes of sterility in dairy cows. (2mks)
  - Damaged uterus
  - Diseases of reproductive organs
  - Returned after birth/placenta
  - Blocked fallopian tubes
  - - Nutrient deficiency e.g. vitamin E (4 x ½ = 2 mks)
10. – Availability of the materials
  - Costs of the materials
  - Suitability of the materials

- Suitability of each type of materials to the prevailing weather condition.
  - Durability of the materials
  - Strength of the materials
  - Workability of the materials
11. – Control water pollution
- Supply of food/nutrients for aquatics use.
  - Aerating water/flowing water.
  - Maintain appropriate depth of water in the pond.
  - Control of stocking rate.
12. – Prevent moisture from rising up.
- Prevent coldness from ascending.
  - Control the rising of termites.
13. – For drying some farm produce.
- For heating water
  - For distribution of clean drinking water.
  - For cooking
  - For generation electricity
14. – Claw hammer
- Cross cut saw
  - Plier
  - Tinsman snips
15. – Pulse rate
- Body temperature
  - Respiratory rate
  - Urination
  - Defaecation
  - Feeding
  - Level of production
16. – Increase efficiency of the machine and reduce the rate of water and tear.
- Reduce heat created by rubbing surfaces.
  - Act as cleaning agent of dirt/dust.
  - Prevent rusting of stationary machines.
17. – Washing udder with warm water
- Massaging udder.
  - Feeding
  - Sound associated with milking
  - Presence of the man milk.

**SECTION B: (20 MARKS)**

18. Use the diagram below to answer the questions that follow.
- a) Identify the implement. (1mk)
- OX – plough/Animals drawn plough
- b) Identify the parts labeled S, V, W and X. (2mks)
- S – Frog
  - V – Draft rod
  - W – Draft chain
  - X – Braces (4 x ½ = 2 mks)
- c) What is the use of the following parts? (2mks)
- P – Adjusting depth of ploughing
  - T – Stabilizes plough during ploughing by pressed on the unploughed land
  - Q – Inverts the furrow slice and burry vegetation
  - U – All parts are attached here (4 x ½ = 2 mks)
19. Below is a structure used in poultry reproduction.
- a) Identify the structure. (1mk)
- Incubator (1 x 1 = 1 mark)
- b) State the main function of the structure. (1mk)
- It is where all the necessary conditions for hatching are provided artificially (1 x 1 = 1 mark)
- c) Give the function of the following in the structure:- (3mks)

- i) Water  
- Gives the required relative humidity
- ii) Source of heat  
- To provided the required warmth
- iii) Thermometer  
- Determine actual temperature in the incubator (1 x 3 = 3 marks)
20. a) 1 - Eggs hatch and larvae emerge  
4 – Nymphs climb onto a 2<sup>nd</sup> host and feed  
5 – Engorged nymphs drop down to lay eggs  
6 – Engorged female drops to lay eggs
- b) Tick keeps on dropping off the animal at every stage of development, so it is not affected by acaricides when the animal is sprayed/dropped.
- c) – Ears  
- Base of the horns  
- Around the eyes  
- Tail switch
- d) - Brown ear tick  
- Bont tick  
- East African bont tick
21. The diagram below shows a type of fence found in a farm. Use it to answer the questions that follow.
- a) Identify the above type of fence. (1mk)  
- Barbed wire fence/post and barbed wire fence (1 x 1 = 1 mark)
- b) Name the parts labeled G, H, J and K. (2mks)  
G: - King post/ Corner post/Strainer  
H: - Standard post  
J: - Dropper  
K: - Strut (4 x ½ = 2 marks)
- c) State one use part labeled J in a fence. (1mk)  
- Prevent sagging of the wire/make the wire touts  
- Discourage animals from squeezing between the wire stands. (Any 1 x 1 = 1 mark)
- d) State the appropriate hole depth for posts labeled G and H. (1mk)  
G – 90cm  
H – 60cm (½ x 2 = 1 mark)

### SECTION C: (40 MARKS)

22. a) State two possible causes of overheating in an engine. (2mks)  
- Low water level in the radiator  
- Loose fan belt  
- Loose/worn out radiator cap  
- Blocked radiator fins  
- Leakage of radiator tank  
- Faulty water pump  
- Very old engine oil (2 x 1 = 2 marks)
- b) Maintenance practices in a cooling system of a tractor. (16mks)  
- Keep the radiator fins clean, materials which block the fins should be removed regularly.  
- Fill the radiator with clean water to avoid overheating.  
- Keep air intake clean in air cooled engines.  
- Maintain the fan by ensuring the correct belt tension; tight tension leads to wear and tear of the bearing while loose tension leads to under cooling radiator before starting to work and keep the recommended level during work.  
- Cold water should not be put in a hot engine after the engine is switched off to prevent sudden contraction.  
- Inspect flow hoses to ensure they are not blocked. Replace defective radiator hoses.  
- Test thermostats and replace those not working well, if necessary.  
- Always check and tighten all nuts before adding an anti-freezer. (Any 8 x 2 = 16 marks)
23. a) Advantages of using a donkey for farm work. (3mks)  
- It is a friendly animal which develops attachment to the owner or handler.  
- It is hardy and generally docile once trained.

- It is relatively cheaper to buy, rear and maintain.
- It is patient when given the right amount of work. (3 x 1 = 3 marks)

b) – Clear the vegetation from the site.

- Level the ground if necessary.
- Measure and mark the trench using wooden pegs.
- Dig a trench 1 – 2 metres deep and 40cm wide.
- Put concrete of strength 1:2:4 at the base of the trench.
- Compact the concrete using a hammer/vibrator.
- Lay down the foundation stone using strong mortar of 1:6.
- The foundation wall should be at least 15cm above the ground surface.
- Place a damp proof course of pvc on top of the foundation wall.
- Fill the trench with soil.

- Compact the soil. (10 x 1 = 10 marks)

c) – Should be spacious.

- Should be well ventilated.
- Should be free from draught.
- Should be easy to clean.
- Should be well lit.
- Should be leak proof.
- Should only allow single calf housing at a time.
- Should allow sun bathing.
- Should have a well drained floor.

(Any 7 x 1 = 7 marks)

24. a) - Disease predisposing factors are condition inside or outside the body of an animal which lead to the animal which contracting a disease or injury.

b) - Age of the animal species of the animal.

- Sex of the animal; Breed of the animal.
- Colour of the animal.
- Change of climate/environment
- Hereditary
- Environment
- Overcrowding
- Physical conditions over fatigue, weakness and pregnancy.
- Animal movement/Animal coming in contact with animals.

c) – Age

- Stage of lactation
- Udder attachment/pendulous udder
- Incomplete milking
- Medical injury
- Poor milking techniques

d) – Poor feeding and nutrition; to prevent deficiency diseases and impart disease resistance.

- Proper feeding and selection; healthy animals should be selected for breeding.
- Proper housing – house should be well.
- Ventilation, leak/proof, well lit, easy to clean spacious, free from drought and well drained.
- Isolation/separation of sick animals
- Animals showing disease symptoms should be isolated/separated from the rest of the herd to avoid further spread.
- Imposition of quarantine – in the event of an outbreak of notifiable disease, movement of animals and their products should be restricted to prevent spread of diseases.
- Prophylactic measures such as administering prophylactic drugs help to control disease.
- Treatment – should be carried out to prevent disease attack and spread.
- Vaccination – regular gives an animal immunity against certain diseases.
- Mass slaughter; animals affected by highly infectious and contagious disease should be slaughtered. to prevent further spread of disease.
- Use of antiseptics and disinfectants
- Antiseptics can be used on open wounds e.g. terramycin sprays.
- Control vectors – disease carrying agents like tsetse flies and ticks are controlled by use of appropriate insecticides.
- Use of healthy breeding stock/artificial insemination

**KMT SECONDARY SCHOOLS EXAMINATIONS 2015**

443/2

AGRICULTURE

PAPER 2

MARKING SCHEME

**SECTION A: (30 MARKS)**

Answer all the questions in this section in the spaces provided.

1. Name any two tractors drawn implements with three-point hitched. (1mk)
  - Disc plough, Mouldboard plough, Mowers some sprayers. (2 x ½ = 2 mks)
2. Name two methods of identifying piglets in the farm. (1mk)
  - Ear notching
  - Ear tattooing
  - Ear tagging (2 x ½ = 1 mk)
- 3.a) State four symptoms of shown by poultry when suffering from Newcastle disease. (2mks)
  - Difficulty in breathing
  - Loss of appetite/Anorexia
  - Paralysis/staggering motion
  - Yellowish/watery diarrhoea
  - Drop in production
  - Bending of neck
  - Production of soft shelled eggs
  - Dropping wings (4 x ½ = 2 mks)
- b) Give the name of the organism that causes East Coast Fever. (½mk)
  - Theilaria parva (1 x ½ = ½ mk)
4. State four desirable characteristics of egg meant for market. (2mks)
  - Medium size
  - Brown shelled in colour
  - Smooth shelled texture
  - Oval in shape
  - Clean (4 x ½ = 2 mks)
5. Give four effects of ticks on livestock bodies. (2mks)
  - Wounds on the skin/hides opening routes for infection.
  - Sick blood causing anaemia.
  - Irritation on livestock bodies.
  - Transmit disease (4 x ½ = 2 mks)
6. Give two features that enable the gizzard to carry out its functions effectively. (1mk)
  - Has thick muscles that rotate
  - Contain small stone/gut
  - Has folds/ridges in inner layer (4 x ½ = 2 mks)
7. State three functions of a differential in a tractor. (1½mks)
  - Transmission or power from the drive shaft to the rear wheel through axle.
  - Moderates/Adjust the motion speed as opposed to engine speed.
  - Enables rear wheels to rotate independently. (3 x ½ = 1½ mks)
8. State one use of the following tools: - (1½mks)
  - a) Spoke shape
    - Smoothing/planning off concave curved edges
  - b) Stock and die
    - Cutting threads in pipes
  - c) Wire strainer
    - Tightening wire during fencing (3 x ½ = 1½ mks)
9. List four causes of sterility in dairy cows. (2mks)
  - Damaged uterus
  - Diseases of reproductive organs
  - Returned after birth/placenta
  - Blocked fallopian tubes
  - Nutrient deficiency e.g. vitamin E (4 x ½ = 2 mks)
10. – Availability of the materials
  - Costs of the materials

- Suitability of the materials
  - Suitability of each type of materials to the prevailing weather condition.
  - Durability of the materials
  - Strength of the materials
  - Workability of the materials
11. – Control water pollution
- Supply of food/nutrients for aquatics use.
  - Aerating water/flowing water.
  - Maintain appropriate depth of water in the pond.
  - Control of stocking rate.
12. – Prevent moisture from rising up.
- Prevent coldness from ascending.
  - Control the rising of termites.
13. – For drying some farm produce.
- For heating water
  - For distribution of clean drinking water.
  - For cooking
  - For generation electricity
14. – Claw hammer
- Cross cut saw
  - Plier
  - Tinsman snips
15. – Pulse rate
- Body temperature
  - Respiratory rate
  - Urination
  - Defaecation
  - Feeding
  - Level of production
16. – Increase efficiency of the machine and reduce the rate of water and tear.
- Reduce heat created by rubbing surfaces.
  - Act as cleaning agent of dirt/dust.
  - Prevent rusting of stationary machines.
17. – Washing udder with warm water
- Massaging udder.
  - Feeding
  - Sound associated with milking
  - Presence of the man milk.

**SECTION B: (20 MARKS)**

Answer all the questions in this section in the spaces provided.

18. Use the diagram below to answer the questions that follow.
- a) Identify the implement. (1mk)
- OX – plough/Animals drawn plough
- b) Identify the parts labeled S, V, W and X. (2mks)
- S – Frog
  - V – Draft rod
  - W – Draft chain
  - X – Braces (4 x ½ = 2 mks)
- c) What is the use of the following parts? (2mks)
- P – Adjusting depth of ploughing
  - T – Stabilizes plough during ploughing by pressed on the unploughed land
  - Q – Inverts the furrow slice and burry vegetation
  - U – All parts are attached here (4 x ½ = 2 mks)
19. Below is a structure used in poultry reproduction.
- a) Identify the structure. (1mk)
- Incubator (1 x 1 = 1 mark)
- b) State the main function of the structure. (1mk)
- It is where all the necessary conditions for hatching are provided artificially

(1 x 1 = 1 mark)

- c) Give the function of the following in the structure:- (3mks)
- Water - Gives the required relative humidity
  - Source of heat- To provided the required warmth
  - Thermometer - Determine actual temperature in the incubator (1 x 3 = 3 marks)
20. a) 1 - Eggs hatch and larvae emerge  
 4 – Nymphs climb onto a 2<sup>nd</sup> host and feed  
 5 – Engorged nymphs drop down to lay eggs  
 6 – Engorged female drops to lay eggs
- b) Tick keeps on dropping off the animal at every stage of development, so it is not affected by acaricides when the animal is sprayed/dropped.
- c) – Ears  
 - Base of the horns  
 - Around the eyes  
 - Tail switch
- d) - Brown ear tick  
 - Bont tick  
 - East African bont tick
21. a) Identify the above type of fence. (1mk)  
 - Barbed wire fence/post and barbed wire fence (1 x 1 = 1 mark)
- b) Name the parts labeled G, H, J and K. (2mks)  
 G: - King post/ Corner post/Strainer  
 H: - Standard post  
 J: - Dropper  
 K: - Strut (4 x ½ = 2 marks)
- c) State one use part labeled J in a fence. (1mk)  
 - Prevent sagging of the wire/make the wire touts  
 - Discourage animals from squeezing between the wire stands. (Any 1 x 1 = 1 mark)
- d) State the appropriate hole depth for posts labeled G and H. (1mk)  
 G – 90cm  
 H – 60cm (½ x 2 = 1 mark)
- SECTION C: (40 MARKS)**  
Answer any two questions in this section in the spaces provided.
22. a) State two possible causes of overheating in an engine. (2mks)  
 - Low water level in the radiator  
 - Loose fan belt  
 - Loose/worn out radiator cap  
 - Blocked radiator fins  
 - Leakage of radiator tank  
 - Faulty water pump  
 - Very old engine oil (2 x 1 = 2 marks)
- b) Maintenance practices in a cooling system of a tractor. (16mks)  
 - Keep the radiator fins clean, materials which block the fins should be removed regularly.  
 - Fill the radiator with clean water to avoid overheating.  
 - Keep air intake clean in air cooled engines.  
 - Maintain the fan by ensuring the correct belt tension; tight tension leads to wear and tear of the bearing while loose tension leads to under cooling radiator before starting to work and keep the recommended level during work.  
 - Cold water should not be put in a hot engine after the engine is switched off to prevent sudden contraction.  
 - Inspect flow hoses to ensure they are not blocked. Replace defective radiator hoses.  
 - Test thermostats and replace those not working well, if necessary.  
 - Always check and tighten all nuts before adding an anti-freezer. (Any 8 x 2 = 16 marks)
23. a) Advantages of using a donkey for farm work. (3mks)  
 - It is a friendly animal which develops attachment to the owner or handler.  
 - It is hardy and generally docile once trained.  
 - It is relatively cheaper to buy, rear and maintain.  
 - It is patient when given the right amount of work. (3 x 1 = 3 marks)

- b) – Clear the vegetation from the site.
- Level the ground if necessary.
  - Measure and mark the trend using wooden pegs.
  - Dig a trench 1 – 2 metres deep and 40cm wide.
  - Put concrete of strength 1:2:4 at the base of the trench.
  - Compact the concrete using a hammer/vibrator.
  - Lay down the foundation stone using strong mortar of 1:6.
  - The foundation wall should be at least 15cm above the ground surface.
  - Place a damp proof course of pvc on top of the foundation wall.
  - Fill the trench with soil.
  - Compact the soil. (10 x 1 = 10 marks)
- c) – Should be spacious.
- Should be well ventilated.
  - Should be free from draught.
  - Should be easy to clean.
  - Should be well lit.
  - Should be leak proof.
  - Should only allow single calf housing at a time.
  - Should allow sun bathing.
  - Should have a well drained floor (Any 7 x 1 = 7 marks)
24. a) – Disease predisposing factors are condition inside or outside the body of an animal which lead to the animal which contracting a disease or injury.
- b) – Age of the animal species of the animal.
- Sex of the animal; Breed of the animal.
  - Colour of the animal.
  - Change of climate/environment
  - Hereditary
  - Environment
  - Overcrowding
  - Physical conditions over fatigue, weakness and pregnancy.
  - Animal movement/Animal coming in contact with animals.
- c) – Age
- Stage of lactation
  - Udder attachment/pendulous udder
  - Incomplete milking
  - Medical injury
  - Poor milking techniques
- d) – Poor feeding and nutrition; to prevent deficiency diseases and impart disease resistance.
- Proper feeding and selection; healthy animals should be selected for breeding.
  - Proper housing – house should be well.
  - Ventilation, leak/proof, well lit, easy to clean spacious, free from drought and well drained.
  - Isolation/separation of sick animals
  - Animals showing disease symptoms should be isolated/separated from the rest of the herd to avoid further spread.
  - Imposition of quarantine – in the event of an outbreak of notifiable disease, movement of animals and their products should be restricted to prevent spread of diseases.
  - Prophylactic measures such as administering prophylactic drugs help to control disease.
  - Treatment – should be carried out to prevent disease attack and spread.
  - Vaccination – regular gives an animal immunity against certain diseases.
  - Mass slaughter; animals affected by highly infections and contagious disease should be slaughtered. to prevent further spread of disease.
  - Use of antiseptics and disinfectants
  - Antiseptics can be used on open wounds e.g. terramycin sprays.
  - Control vectors – disease carrying agents like tsetse flies and ticks are controlled by use of appropriate insecticides.
  - Use of healthy breeding stock/artificial insemination



**THARAKA SOUTH JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

Paper - 443/1

**July / August 2015****Time: 2 hours****SECTION A (30 marks)**

Answer ALL questions in this section on the spaces provided.

1. Give four types of livestock farming. (2 marks)
2. State four advantages of mixed farming. (2 marks)
3. Name four types of agricultural services available to farmer. (2 marks)
4. State TWO precautions to be observed in soil sampling. (1 mark)
5. State FOUR objectives of land tenure reforms. (2 marks)
6. State FOUR stages of land adjudication and registration. (2 marks)
7. a) Define opportunity cost. (1 mark)  
b) Give two types of labour records (2 marks)
8. Name FOUR processes involved in chemical weathering. (2 marks)
9. State four importance of **drainage** in farming. (2 marks)
10. Give four ways in controlling **river bank erosion**. (2 marks)
11. State four effects of **solifluction** (2 marks)
12. State four reasons for **minimum tillage** (2 marks)
13. a) Name two tractor implements for sub-soiling (1 mark)  
b) Give two reasons for sub-soiling. (1 mark)
14. Name four factors that determine hay quality. (2 marks)
15. State four factors that are considered during the timing of planting. (2 marks)
16. Name two factors that affect the efficiency of pesticides. (1 mark)

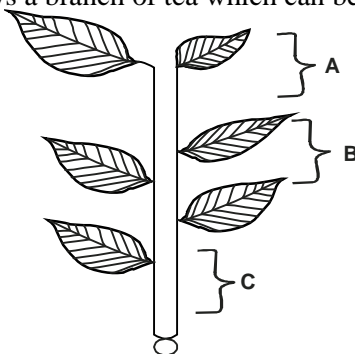
**SECTION B (20 marks)**

Answer ALL the questions in this section in the spaces provided.

17. Two garden soil samples A and B weighing 100gms each were set aside in a room for some hours. 50gms of water was added to sample A and then weighed. The weight was 148gms. Sample B (100gms) was heated in an oven at 105°C until a constant weight of 95gms was achieved. When it was further heated at 400°C a constant weight of 92gms was achieved. This information is illustrated in the table below.

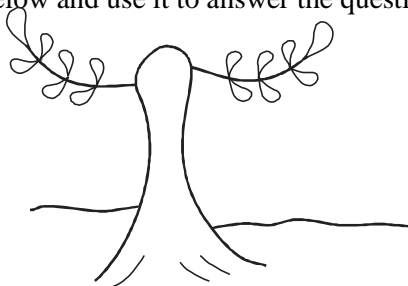
| Soil sample | Original weight | Weight after addition of water | Weight after heating at 100°C | Weight after further heating at 400°C |
|-------------|-----------------|--------------------------------|-------------------------------|---------------------------------------|
| A           | 100gms          | 148gms                         |                               |                                       |
| B           | 100gms          |                                | 95gms                         | 92gms                                 |

- a) From the information above.
    - i) What is responsible for the loss of weight when 50gms of water was added to 100gms of soil? (1 mark)
    - ii) What was the percentage loss. (1 mark)
  - b) What was responsible for the loss when 100gms of soil was heated at 100°C (½ mark)
  - c) i) What caused the change in weight when the soil was continuously heated at 400°C from 100°C. (½ mark)  
ii) Calculate the percentage loss in c(i) above. (1 mark)
  - d) State four effects of the substance that was lost in sample when it was heated at 400°C (2 marks)
18. The following diagram shows a branch of tea which can be used to provide a cutting for a tea production.



- a) Which section of the branch labelled A, B, C is suitable for cutting? (1 mark)
- b) Give a reason for your answer. (1 mark)
- c) Draw an illustration to show how the cutting obtained for providing the cutting. (1 mark)

19. Study the diagram below and use it to answer the questions that follow.



- i) Identify the field management practice shown above. (1 mark)
- ii) State **three** importance of such practice. (3 marks)
- iii) State one method of pruning. (1 mark)

20. Below is a diagram of crop pest.



- a) Identify the pest in the diagram. (1 mark)
- b) Suggest **three** ways of controlling the pests. (2 marks)
- c) Name any **two** diseases of cabbages. (3 marks)

### SECTION C (40 marks)

Answer any TWO questions in this section

21. a) Describe the factors which determine the stage of harvesting crops. (5 marks)
- b) Explain any **five** advantages of crop rotation. (10 marks)
- c) Give **five** factors to consider in adopting farming system. (5 marks)
22. a) Describe factors contributing to competitive ability of weeds. (6 marks)
- b) Outline the characteristics of ideal agro-forestry tree species. (9 marks)
- c) Outline cultural methods of controlling crop pests. (5 marks)
23. a) State three forms of conserving forage? (3 marks)
- b) State and explain three methods through which training is achieved in crop production. (6 marks)
- c) Discuss the production of tomatoes under the following subheadings.
- i) Ecological requirements. (3 marks)
- ii) Land preparation (4 marks)
- iii) Diseases and their control (4 marks)

**THARAKA SOUTH JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

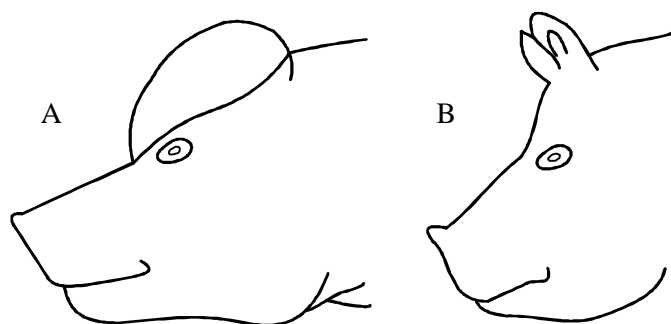
Paper - 443/2

**July / August 2015****Time: 2 hours****SECTION A (30 marks)**Answer ALL the questions in this section in the spaces provided.

1. State **FOUR** factors considered when selecting an implement for primary cultivation. (2 marks)
2. Name **THREE** types of silo used in the preparation and storage of silage. (1½ marks)
3. a) What is a notifiable disease as used in livestock health. (1 mark)  
b) Name **FOUR** notifiable diseases in cattle. (2 marks)
4. State **FOUR** disadvantages of natural mating in livestock production. (2 marks)
5. List **FOUR** distinguishing characteristics of a Jersey. (2 marks)
6. State **FOUR** features of an ideal rabbit hutch. (2 marks)
7. State **THREE** reasons for feeding livestock. (1½ marks)
8. Give **TWO** factors that may lead to conception failure after service in heifers. (1 mark)
9. Give **FOUR** uses of harrows on the farms. (2 marks)
10. State **TWO** importance of isolating sick animals in the farm. (1 mark)
11. List **FOUR** structural features of a good maize store. (2 marks)
12. Give the name of the act of giving birth (parturition) in the following species of animals. (1½ marks)
  - i) Rabbits
  - ii) Goats
  - iii) Cattle
13. Mention **FOUR** properties of concrete that make it suitable for constructing farm buildings. (2 marks)
14. State **THREE** characteristics of colostrums that make it suitable for new born livestock. (1½ marks)
15. State **FOUR** precautions farmers should take when handling bees. (2 marks)
16. Give **FOUR** reasons why many farmers in Kenya do not use artificial incubation. (2 marks)
17. State **TWO** factors which influence quality of honey. (2 marks)

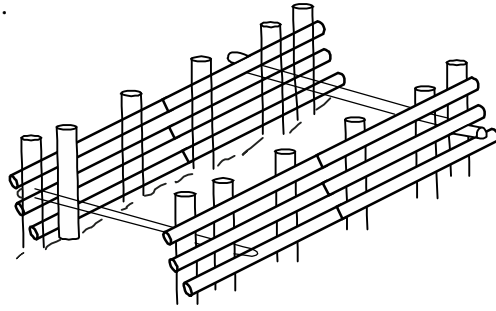
**SECTION B (20 marks)**Answer ALL the questions in their section in the spaces provided.

18. Below are head illustrations of two breeds of pigs commonly kept in Kenya. Study them carefully and then answer the questions that follow.

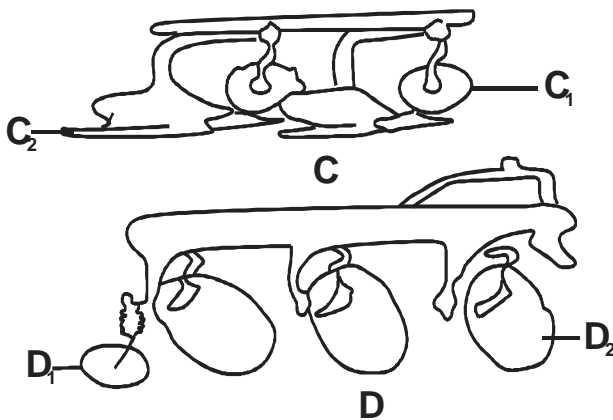


- a) Name the breeds of pigs where heads are shown on each of the diagram. (2 marks)
  - i) Breed A
  - ii) Breed B
- b) Name the type of product each of the breeds named in (a) above is kept for. (2 marks)
- c) Give **TWO** physical characteristics which can be used to distinguish the two breeds of pigs from each other. (2 marks)

19. Below is an illustration of structure used when handling animals in the farm. Study it carefully and then answer the following questions.



- a) Identify the structure in the diagram. (1 mark)  
 b) List **FIVE** materials used to construct the above structure. (5 marks)  
 c) Name any **FOUR** livestock management practices that a farmer can carry out in the above structure. (4 marks)
20. Study the diagram below carefully and then answer the questions that follow.



- a) Identify the implement shown in the diagram C and D. (1 mark)  
 b) Name the parts labelled C<sub>1</sub>, C<sub>2</sub>, D<sub>1</sub>, D<sub>2</sub> on the diagrams. (2 marks)  
 c) Give one advantage of using the implement C over implements D in primary cultivation. (2 marks)
- SECTION C : 40 marks)

**Answer any TWO questions from this section.**

21. a) State and explain eight materials and equipment used during milking. (8 marks)  
 b) List **FOUR** qualities of good eggs used for incubation. (4 marks)  
 c) State **FOUR** factors affecting milk composition. (8 marks)
22. a) Describe the requirements of a calf pen. (6 marks)  
 b) Give the advantages of a four stroke cycle engine. (5 marks)  
 c) Explain nine ways in which diseases can be controlled in livestock. (9 marks)
23. a) Explain the factors that influence the supply of a commodity in the market. (12 marks)  
 b) Discuss the principles of co-operatives. (8 marks)

**THARAKA SOUTH JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

Paper - 443/2

**July / August 2015****Time: 2 hours****marking scheme**

1. Give four types of livestock farming
  - Pastoralist / mammalian livestock farming
  - Fishing farming / aquaculture / crocodile farming
  - Bee keeping apiculture
  - Poultry keeping
2. State four advantages of mixed farming
  - Livestock provide manure for growing crops
  - Crop residuals provide food livestock
3. Name four types of Agricultural services available to farmer
  - Extension and training
  - Banking
  - Credit
  - A.I
  - Research
  - Marketing
  - Tractor hire service
4. State two precautions to be observed in soil sampling (1mk)
  - Avoid unusual areas e.g under fence
  - Collect at right depth
  - Do not contaminate samples
5. State four objectives of land tenure reforms
  - Encourage conservation measures of land
  - Increase productivity of both land and labour
  - Encourage commercial farming and self employment
  - Security of tenure hence more investment
  - Enhance flexibility in farming depending on market demands
  - Enhance stalemnt schemes and improve land use through irrigation 4 x ½ = 2 mks
6. State four stages of adjudication and registration
  - Adjudication officials with chiefs and local farmers on land ownership
  - Surveying and measurement of adjudicated land
  - Maps and records submitted to the title deed holder and their land by land by land office
  - Registration of title deed holder and their land by land registra later issues them
7. a). Define opportunity cost
  - The returns from the best alternative foregone
 b. Give two types of labour records
  - Muster roll
  - Labour utilization
8. Name four processes involved in chemical wreathing (2mks)
  - Oxidation
  - Carbonation
  - Hydration
  - Hydrolysis
9. State four importance of drainage in faming
  - Improves soil volume
  - Reduce soil erosion
  - Improves soil temperature
  - Improves soil aeration
  - Improves microbial activities
10. Give four ways of controlling bank erosion
  - Construction of dams that retains flowing water
  - Construction of dykes

- Planting trees along the river banks to hold soil together
  - Leaving uncultivated land on either side of the river
11. State four effectives of solidification
- Soil fertility / transferred to other destructions
  - Temporary lakes are created / river causes changed
  - Loss of property and life
  - Permanent scars on landscape
12. State four reasons for effecting minimum tillage.
- reduce the cost of farming
  - control soil erosion
  - maintain soil structure
  - to conserve soil moisture prevent disturbance of roots and underground plant structures
  - avoid exposure of humus to sun's heat
13. a). name two tractor implements for sub soiling
- Chisel plough
  - Sub oilers
  - Cultivators heavy type
- b) Give two reasons for sub soiling**
- break hardpans in orders to improve soil structure
14. Name four factors that determine hay
- Forage species used in making
  - Stage of harvesting the forage
  - Length of drying the forage
  - Weather condition during drying forage
  - Condition of the storage structure whether leaking
  - Presence of foreign material in forage like weeds.
- 4 x 1/2 = 2mks
15. State four factors that are considered during the timing of planting
- Type of crop to be planted - Type of soil and its water retention
  - Market demand
  - Prevalence of pest and disease
  - Weed control made easy by early planting
16. Name two factors that affect the efficiency of pesticides Concentration of pesticides
- Time of applying the pesticides
  - Weather condition
  - Persistence of pesticide

### Section B (2 0Marks)

17. From the information
- i). Air was lost from the soil 1mk
- ii) What was the percentage loss**  
 $150 - 148 = \frac{2}{100} \times 100 = 2\%$  **1mk**
- b) What was responsible for the loss of weight when 100gms of soil was heated at 100°C (1/2 mk)**  
 Water was lost from the soil
- c) i) What caused the change in weight when the soil was continuously heated to 400°C from 100°C 04mk)**  
 Humus /organic matter bunt/loss
- ii) Calculate the percentage loss in c(i) above**  
 $95 - 92 = 3 = \frac{3}{95} \times 100 = 3\%$
- d) - Improve structure**
- Add nutrients
  - Prevents erosion
  - Improve drainage
  - Modify soil temperature
  - Improve water holding capacity
  - Buffer soil pH
  - Provide shelter and food for soil-microorganisms
18. i). B ½ mk
- a). Give a reason for your answer (1mk)**  
 It is mature and roots fast

c) Draw an illustration to show how the cutting obtained for providing the cutting



19. i). Multiple stem pruning

- To remove the plant so that it can have the required shape.
- To remove the diseased and unwanted parts of a plant such as extra suckers, leaves, branches, flowers or even stem
- Control of cropping
- To facilitate picking
- To ease the penetration of the spray
- It controls pests and diseases

any 3x1= 3mks

iii) - Pinching out

- Annual pruning
- Coppicing or pollarding

20. a). cutworm 1 x 1 = 1 mk

a) **Ways of controlling cut worms**

- Use appropriate insecticides
- Crop rotation
- Early planting

2x1 = 2mks

b) **Cabbages diseases**

- Bacteria wilt -Ring spot -Damping off
- Black pot
- Black leg/dry rot canker -Dark leaf spot 3 x1= 3mks

**SECTION 4 (40MKS)**

21. a). Describe factors determining the stage of harvesting crops

- Use of crop/purpose
- Market demand/fast preference weather conditions
- Prevailing market price
- Concentration of the required chemicals e.g Pyrethrum, tea and coffee.

5mks

b) **Expalin five advantages of crop rotation**

- Improves soil fertility - when legumes are included in the rotation, Nitrogen is fixed/ added in the soil

ii) Control of pests/diseases

- Crop rotation disrupts the life cycle of certain pests and diseases.

iii) Control weeds - which are specific to certain crops for example stigma in cereal/ cover crops smoothers certain weeds.

iv) Control of soil erosion- Crops planted in rows eg Maize should

- v) Better use of soil nutrients - different crops have different root systems and draw nutrients from varying soil horizon /different nutrient demands therefore alternating leads to proper utilization

vi) Improve soil structure - Grass lays established will improve soil structure through the roots by binding soil particles together.

- During grass lays period organic matter will accumulate to enrich soil structures *Stating lmk Explanation lmk*

5 x 2 = 10mks

b) **Five factors to consider in adopting farming system**

- Size of the farm
- Environmental factors
- Aims or objectives of the farmers
- Farms knowledge and skills
- Availability of resources
- Government policy
- Security

1 x 5=5 mks

22. a). Factor contributing to competitive ability of weeds

- Ability to produce large quantities of seeds
- Weeds and seeds remain viable in the soil for a long time

- Easy and successful dispersal mechanism of most weeds and seeds
  - Elaborate or extensive root system
  - Ability to complete their life cycle in a short time
  - Ability of some weeds to propagate vegetatively
  - Ability to survive even under adverse environmental conditions
- 5 x 1 = 5 mks

**b) Characteristics of ideal agroforestry trees**

- Nitrogen fixing ability
- Fast growing ability
- Multipurpose nature
- By products production
- Deep rooted with shallow rootzone
- Nutritious
- Palatable

**10x1=10 mks**

**c) Cultural methods of controlling crop pests.**

- Timely planting
- Timely harvesting
- Proper tillage
- Close season
- Trap cropping
- Crop rotation
- Planting resistant crop varieties
- Field hygiene
- Crop nutrition
- Restriction of alternative host
- Use of clean planting materials

**23. a). State three forms of conserving forage**

- Hay
- Silage
- Standing forage

**b) State and explain three methods through which training is achieved in crop production (6 mks)**

- i) Staking- Supporting plants having weak stems with the help of thin strong stick eg for tomatoes.
- ii) Propping - Producing support to tall varieties of bananas and those with heavy branches
- iii) Trelishing- Providing support to crops with vines using wires or sisal strings.

**c) Discuss the production of tomatoes under the following subheadings:**

**i) Ecological requirements (3mks)**

- Attitude - 0-2100mm a.s.l
- Rainfall - 760mm - 1300mm
- Soil - deep fertile and well drained

**ii) Land preparation (4 mks)**

- Clear the vegetation
- Soil is dug deep/dry cultivation and all weed especially the perennial ones controlled
- Trash collected/secondary cultivation
- Level the area

**iii) Disease and their control (4 mks)**

- Tomato Blight - Preventive spraying using fungicides
- Bacteria wilt - Uproot and burn affected plants
- User certified seeds -Crop rotation
- Blossom end rot - Regulate watering Top dressing with correct amount of nitrogen



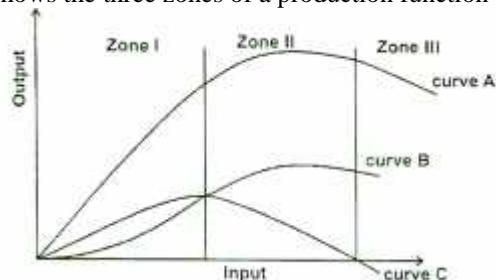
**MERU COUNTY JOINT EXAMINATION**  
**KENYA CERTIFICATE OF SECONDARY EDUCATION (K.C.S.E)**  
**443/1**  
**AGRICULTURE PAPER 1**  
**JULY/AUGUST 2015**

**SECTION A:(30 Marks)**

1. (a) Define the term forage crop (1 mark)
- (b) Differentiate between pure stand and mixed stand pastures. (1 mark)
2. Give four advantages of intensive farming. (2 marks)
3. Distinguish between intercropping and mixed cropping. (1 mark)
4. State four reasons for deep ploughing during land preparation. (2 marks)
5. Name one vegetable material used to propagate each of the following crops. (2 marks)
  - i Bananas
  - ii Pineapples
  - iii Irish potatoes
  - iv Pyrethrum
6. Explain four damages caused to field crops by rodents. (2 marks)
7. Name the micro-nutrient that perform the following roles in plants.
  - a. Respiration and utilization of iron (½ mark)
  - b. Formation of growth hormones and in reproduction process by some plants. (½ mark)
  - c. Absorption of water and translocation of sugar in some plants. (½ mark)
1. State two characteristics considered when choosing water pipes. (1 mark)
2. Explain how each of the following practices control crop pests.
  - a) Crop rotation (½ mark)
  - b) Proper tillage (½ mark)
10. State four functions of Agricultural Society of Kenya A.S.K (2 marks)
11. Name two weeds that are
  - a. Irritative to farm workers (1 mark)
  - b. Poisonous to livestock (1 mark)
12. State five qualities that should be considered when selecting seeds for planting. (2 ½ marks)
13. State three factors that influence the depth of planting. (1 ½ marks)
14. State four ways of harvesting water on a farm. (2 marks)
15. State three factors influencing soil erosion. (1 ½ marks)
16. List three effects of high temperature on crop production. (1 ½ marks)
17. State four financial documents that should be kept on a farm. (2 marks)

**SECTION B(20marks)**

18. The diagram below shows the three zones of a production function curve, use it to answer the questions that follow.



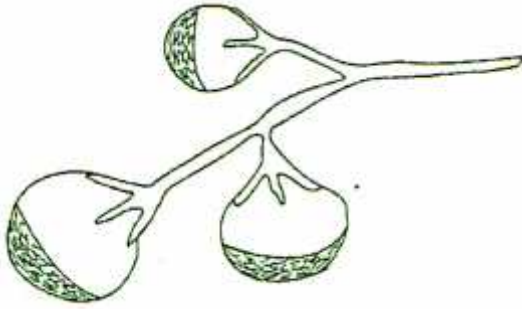
- Name the curves labelled A, B and C (3 marks)
- (b) Why are zones I and III referred to as irrational zones of production.
- Zone I (1 mark)
- Zone II (1 mark)
19. Study the illustration below and answer the questions that follow.



- What do the figure labelled on the diagram stand for i.e. 18:46:0 (1 mark)
- a) What class of inorganic fertilizer does DAP fertilizer belong to and why. (2 mark)

- b) Calculate the amount of filler material in 200kg of DAP with a fertilizer grade of 18:4:0  
 20 Study the diagram below and answer the questions that follow.

(2 marks)



- i Identify the tomato disease on the diagram above. (1 mark)  
 ii Describe the symptoms of the disease identified in (i) above. (2 marks)  
 iii Give three control methods of the disease identified in (i) above. (3 marks)
- 21 Outline the precaution observed when harvesting tea. (4 marks)
- SECTION C:40 marks)**
- 22 (a) Explain five objectives of the million acre scheme. (5 marks)  
 (b) Explain five farming practices that characterize organic farming. (5 marks)  
 (c) Discuss ten roles of a farm manager. (10 marks)
23. (a) Explain the importance of drainage as a land reclamation method. (10 marks)  
 (b) State and explain five advantages of crop rotation. (10 marks)
24. (a) Outline factors that influences demand of commodity in the market. (6 marks)  
 (b) Explain the importance of agroforestry in the farm. (14 marks)

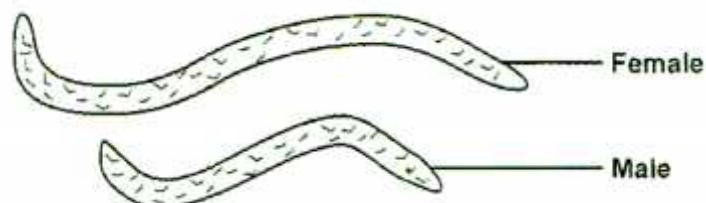
**MERU SOUTH JOINT EXAMINATION**  
**KENYA CERTIFICATE OF SECONDARY EDUCATION (K.C.S.E)**  
**443/2**  
**AGRICULTURE PAPER 2**  
**JULY/AUGUST 2015**

**SECTION A :( 30 Marks)**

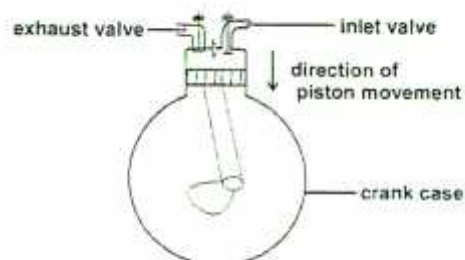
- 1 Name a breed of goat kept for hair production. (1 mark)
- 2 State two ways in which barbed wire fences may be reinforced in the farm. (1 mark)
- 3 Broadly, classify two causes of infertility in herd of cattle. (2 marks)
- 4 Name the tool that is used together with the following as a pair. (2 marks)
  - i Hypodermic needle
  - ii Leading stick:
  - iii Elastrator:
  - iv Canula:
- 5 State three signs of anthrax observed in the carcass of cattle. (1 ½ marks)
- 6 State four ways by which cannibalism in poultry could be avoided. (2 marks)
- 7 Name the intermediate host of the following parasites. (2 marks)
  - a. Tapeworm
  - b. Liver fluke
- 8 List down two groups of cattle that are susceptible to milk fever. (2 marks)
- 9 Give two situations which may necessitate the preparation of artificial colostrum. (2 marks)
- 10 Give two uses of gears in a tractor. (2 marks)
- 11 List four tools used for laying concrete blocks when constructing a wall. (2 marks)
- 12 State four characteristics of clean, high quality milk. (2 marks)
- 13 Give three maintenance practices that should be carried out on cross cut saw. (1 ½ marks)
- 14 What is the cause of grass staggers in animals? (1 mark)
- 15 Give the meaning of the following terms used in livestock health. (2 marks)
  - i incubation period
  - ii Mortality rate
16. Write down two common examples of chemical cause of diseases among livestock. (2 marks)
17. Name two main parts of a farm building. (2 marks)

**SECTION B:(20 Marks)**

18. Study the diagram of an internal parasite of livestock in the farm and answer the questions that follow.

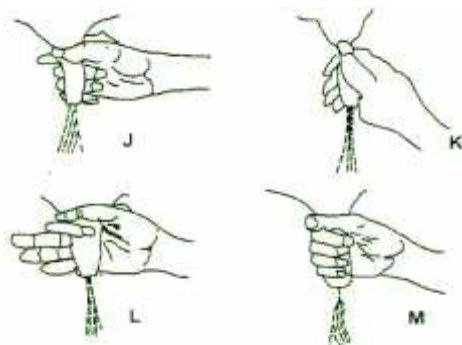


- a) What disease condition would an animal infected with the above parasite develop? (½ mark)
  - b) A cow is suspected to have suffered the disease condition in (a) above before it was slaughtered for meat. State four postmortem symptoms that would confirm occurrence of this disease. (2 marks)
  - c) Write down four ways of controlling the internal parasite in the diagram above. (2 marks)
19. The diagram below illustrates a stroke in a four stroke cycle engine. Study it then answer the questions that follow. The arrow shows the direction of motion of the piston.

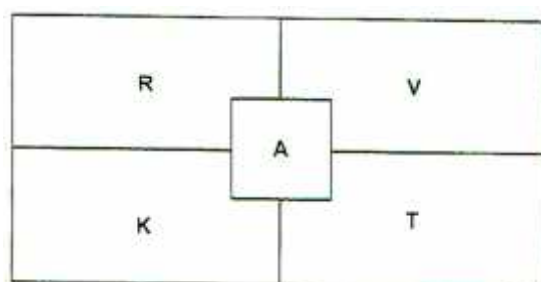


- a) Identify the stroke illustrated by the diagram. (1 mark)
- b) Identify the type of tractor engine illustrated in the diagram on the basis of type of fuel it uses. (1 mark)
- c) Give a reason for your answer in (b) above. (1 mark)
- d) Name in the correct order, the next two strokes which follow the one illustrated above. (1 mark)
- e) What is a compression ignition engine? (1 mark)

- 20 The diagrams labelled J, K, L and M below show possible ways of drawing milk from the teat of a cow during milking. Study the illustrations and then answer the following questions.



- a) Which illustration shows the proper way of milking? (½ mark)  
 b) How long should it take to milk a cow from the start to the end of milking? (½ mark)  
 c) Outline the preparation you would carry out on the animal before it is ready for milking. (3 marks)  
 d) Mention two practices carried out on the milk after milking. (1 mark)
21. The diagram below illustrates a grazing system.



- a) Name the type of grazing system indicated. (½ marks)  
 b) On the diagram, indicate the sequence of animal movement using arrows. (1 mark)  
 c) Name the part labelled A. (1 mark)  
 d) Give the main reason for locating the structure labelled A in the position as in the diagram. (1 mark)  
 e) Give three advantages of this system of grazing. (1½ marks)
22. (a) Explain the measures that are taken to prevent occurrence of livestock diseases in the farm (10 marks)  
 (b) List five side effects of livestock. (5 marks)  
 (c) State five ways through which infectious disease can spread in livestock. (5 marks)
23. (a) State the difference between exotic cattle (*Bos taurus*) and indigenous cattle (*Bos indicus*) (10 marks)  
 (b) Explain ten advantages of battery cage system in poultry rearing. (10 marks)
24. (a) Outline factors that should be considered when sitting farm structures. (10 marks)  
 (b) Describe the factors that influence the selection of construction materials. (10 marks)

**MERU SOUTH FORM FOUR JOINT EXAMINATION**

Kenya Certification of Secondary Education

**AGRICULTURE**

Paper - 443/1

**July/August 2015****Marking Scheme**

1. **a) Forage crop**  
A forage crop is a crop that grows naturally or is planted by man for the purpose of feeding livestock  **$1 \times 1 = 1 \text{ mark}$**
- b) **Pure stand and mixed stand pastures**  
Pure stand - either grass or legumes on them while mixed stand have both grass and legume grown together.  
 **$1 \times 1 = 1 \text{ mark}$**
2. **Advantages of intensive farming**
  - Increase production per unit area.
  - For easy farm supervision.
  - Maximise use of available land.
  - Utilises technology to increase production.
  - Ideal for densely populated area.  **$\frac{1}{2} \times 4 = 2 \text{ marks}$**
3. **Intercropping and mixed cropping**
  - Intercropping - growing two or more crops in the same field at the same time.
  - Mixed cropping - growing of two or more crops in the same field at the same time but in specific / separate sections.  
 **$1 \times 1 = 1 \text{ mark}$**
4. **Reasons for deep ploughing**
  - Facilitate aeration
  - Remove deep rooted roots.
  - Exposes lower soil layers to weathering.
  - Facilitate development of deep rooted crops.
  - Facilitate drainage.
  - Breaks soil hard pans / facilitate water infiltration.
  - Brings up previously leached nutrients.  **$\frac{1}{2} \times 4 = 2 \text{ marks}$**
5. **Vegetative materials.**
  - i) Bananas - suckers  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ marks}$**
  - ii) Pineapples
    - slips
    - crowns
    - suckers  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
  - iii) Irish potatoes
    - stem tubers  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ marks}$**
  - iv) Pyrethrum – splits  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
6. **Damage caused by rodents**
  - Unearth planted seeds / germinating seedlings.
  - Digging out roots and tubers.
  - Destroy cereal heads / cobs.
  - Gnaw barks / ring barking.
  - Spoil pastures by making holes / tunnels on pasture land.  **$\frac{1}{2} \times 4 = 2 \text{ marks}$**
7. **Micro-nutrients**
  - a) Copper  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
  - b) Zinc  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
  - c) Boron  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
8. **Characteristics considered when choosing water pipes**
  - Durability
  - Workability
  - Colour
  - Size/ diameter of pipe
  - Strength / ability of withstand pressure / thickness pipe.
  - Cost  **$\frac{1}{2} \times 2 = 1 \text{ mark}$**
9. **Control of crop pest**
  - a) Starves the pest to death.  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
  - b) Exposes soil borne pest to adverse weather conditions/ to predators.  **$\frac{1}{2} \times 1 = \frac{1}{2} \text{ mark}$**
10. **Functions of ASK**
  - Organise national ploughing competition.
  - Organise and run young farmer club.
  - Publish the Kenya farmer magazine.
  - Hold competition shows and trade fair on livestock, agricultural horticultural produce, farm implements of machinery.
  - Publishes the Kenya stud book.

- Encourages breeding and importation of pure bred and improved stock.
- Promote agricultural industries and other industries related to agriculture.
- Promote and assist in official milk recording schemes independently or in association with stakeholders.

$\frac{1}{2} \times 4 = 2$  marks

**11. a) Weeds initiative to farm workers**

- Double thorn
- Stinging nettle
- Devils horse whip  $\frac{1}{2} \times 2 = 1$  mark

**b) Poisonous to livestock**

- Lantana
- Sodom apple
- Thorn apple / datura.
- Subukia weed.
- Mallow
- Abutilon
- Flower of the hour  $\frac{1}{2} \times 2 = 1$  mark

**12. Qualities considered when selecting seeds for planting.**

- Uniform in size / colour / shape.
- Clean
- High germination percentage /viable.
- High vigour.
- Free from pests / diseases / healthy.
- Have no physical damage.

$\frac{1}{2} \times 5 = 2\frac{1}{2}$  marks

**13. Factors influencing depth of planting**

- soil type.
- Soil moisture content
- Size of seed.
- Type of germination.  $\frac{1}{2} \times 3 = 1\frac{1}{2}$  marks

**14. Ways of harvesting water on the farm**

- Roof catchment.
- Rock catchment
- Dams/ weirs
- Retention ditches / level terraces.
- Ponds / water pans.  $\frac{1}{2} \times 4 = 2$  marks

**15. Factors influencing soil erosion**

- ground cover
- slope of the land/topography.
- Soil type.
- Soil depth.
- rainfall intensity / amount
- land use/ deforestation / burning vegetation/plating annual crops on steep slopes.  $\frac{1}{2} \times 3 = 1\frac{1}{2}$  marks

**16. Effects of high temperature on crop production**

- Increase evapo transpiration leading to wilting of crops.
- Increases growth rate / hastens maturity.
- Improve quality of some crops e.g. oranges pineapples.
- Increase incidences of disease infection and pests infestation.  $\frac{1}{2} \times 1 = 1\frac{1}{2}$  marks

**17. Financial documents**

- Receipt
- Invoice
- Statement
- Purchase order
- Delivery note  $\frac{1}{2} \times 4 = 2$  marks

**SECTION B (20 marks)**

**18. a) Names of curves.**

- A total produce curve  $1 \times 1 = 1$  mark  
 B average product curve  $1 \times 1 = 1$  mark  
 C margin product curve  $1 \times 1 = 1$  mark

**b) Zone I**

Resources are being under-utilized.  $1 \times 1 = 1$  mark

**Zone III**

Resources are being over utilized.  $1 \times 1 = 1$  mark

**19.**

- a) 18 : 46 : 0 @ fertilizer grade / 18% N, 46% P<sub>2</sub>O<sub>5</sub> and 0% K<sub>2</sub>O  $1 \times 1 = 1$  mark

b) Class of inorganic fertilizer and reasonCompound fertilizer  $1 \times 1 = 1 \text{ mark}$ It contains nitrogen and phosphorus  $1 \times 1 = 1 \text{ mark}$ c) Amount of filler material  $1 \times 1 = 1 \text{ mark}$  $= 72 \text{ kg}$   $1 \times 1 = 1 \text{ mark}$ 

## 20. i) Tomato disease

Blossom end rot  $1 \times 1 = 1 \text{ mark}$ 

## ii) Symptoms

- Water soaked spots develop on the fruit style remains scar.
- It turns brown then enlarges to cover half of the fruit.  $2 \times 1 = 2 \text{ marks}$

## iii) Controls methods

- Regular watering.
- Avoid too much nitrogen at early stages.
- Apply enough calcium in young plants.  $3 \times 1 = 3 \text{ marks}$

21. Precautions when harvesting tea

- plucked leaves should be put in woven baskets.
- do not compress the leaves in the basket.
- plucked tea leaves must be kept under cool shade as plucking continues or while awaiting transportation to the factory.
- Plucked leaves must be taken to the factory immediately after plucking /within 24 hours.  $4 \times 1 = 4 \text{ marks}$

**SECTION (40 marks)**22. a) Objectives of million are scheme.

- To settle former employees of European farmers and squatters.
- To create employment.
- To reduce population pressure in the African reserves.
- To transfer land from white settlers to Africans.
- To maintain production levels achieved by white settlers farmers.
- To earn foreign exchange from sale of cash crops.
- To increase agricultural production through better methods of land utilisation.  $5 \times 1 = 5 \text{ marks}$

b) Farming practices that characteristics organic farming

- mulching.
- application of organic manure.
- Crop rotation the control weeds / pests / diseases.
- Use of medicinal plant products to control diseases / parasites / pests.
- Rearing livestock on natural feed stuffs.
- Physical / cultural / biological control of weeds / pests / parasites / diseases.  $5 \times 1 = 5 \text{ marks}$

c) Roles of a farm manager

- Short term planning for quick decisions to avoid losses incase of an urgent activity.
- Long-term planning based on decision made on future plans.
- Collecting information relevant to the farm enterprise.
- Budgeting for future income and expenses.
- Comparing standards of the farm / enterprises with the set standards and making appropriate adjustments.
- Detecting weaknesses and finding ways of overcoming them.
- Keeping up to date records and using them to run the farm daily.
- Guiding and supervising implementation of farm plan.
- Making predictions of the arm business.
- Accounting an all financial transactions.
- Bearing risks / taking responsibility for decision made.

23. a) Importance of drainage

- Helps to increase soil aeration - when excess water is removed, plant roots get enough air for proper growth.
- Is increase soil volume - increase amount of soil around the root zones from which roots can easily get nutrients.
- Raises soil temperature - improves the rate at which the soil warms up for better plant growth.
- Increases microbial activities - due to good aeration . Micro-organisms increase in the soil which improves soil structure and food for micro-organisms.
- Reduces soil erosion - this increases water infiltration rate, reduces runoff and increases water holding capacity.
- Removes toxic substances - soluble salts e.g. sodium increases in concentration to toxic levels to plants which are grown in water logged soils. such salts are drained away.  $5 \times 2 = 10 \text{ marks}$

b) Advantages of crop rotation

- Improves soil fertility -when legumes are included they form nitrogen
- Control pests / diseases - it disrupts life cycle of certain pest and diseases.
- Control weeds - helps to beak life cycle of weeds that are specific to certain crops / cover crops in a rotation with smother the weeds.
- Better use of soil nutrients - different crops draws nutrients from varying soil horizons therefore when alternated leads to better nutrient utilization.
- Control soil erosion - when a cover crop is included it reduces soil erosion.

- 
- Improves soil structure - grass leys roots binds soil particles together and organic matter accumulates in the soil during the grass ley period.  $5 \times 2 = 10$  marks

**24. a) Factors influencing demand of a commodity in the market.**

- Taste and preference
- Price of the commodity.
- Number of consumers
- Availability of alternative commodity.
- Income of consumer.
- Expected price charge of the commodity.
- Religions / traditions / customs / taboos.
- Advertisements.  $6 \times 1 = 6$  marks

**b) Importance of Agro forestry in the farm**

- Increase land productivity per unit area.
- Source of energy as wood fuel.
- Provides food e.g. fruits.
- Produces high tree products.
- Tree root systems are deep and recovers leached nutrients thus helping in nutrient recycling.
- Tree roots hold soil particles together thus controlling soil erosion.
- Tree roots absorb water from deep soil horizons helping water recycling.
- Encourages / promoted biodiversity on a farm.
- Regulates / creates micro-climates.
- Trees provide materials for home craft.
- Trees beautify the land.
- Trees use carbon (IV) oxide and reduces atmospheric pollution and global warming.
- Trees act as wind breakers.
- Trees leaves decomposes / organic matter which increases water holding capacity / retention.  $14 \times 1 = 14$  marks



**MERU SOUTH FORM FOUR JOINT EXAMINATION**

Kenya Certification of Secondary Education

**AGRICULTURE**

Paper - 443/2

**July/August 2015****Marking Scheme**

1. Breed of goat kept for hair production
  - Angora goat / mohair  $1 \times 1 = 1 \text{ mark}$
2. Reinforcing barbed wire fence
  - Use of droppers.
  - Use of concrete to fix posts;
  - Use of wire and wooden strainers.
  - Use of struts and braces.  $2 \times \frac{1}{2} = 1 \text{ mark}$
3. Causes of infertility
  - faulty / failure of the reproductive mechanism;
  - poor feeding;
  - breeding diseases;  $2 \times 1 = 2 \text{ marks}$
4. Pairs tools:
  - i) Hypodermic needle hypodermic syringe.
  - ii) Leading stick - bull ring;
  - iii) Elastractor - rubber ring;
  - iv) Canula - Trocar;  $4 \times \frac{1}{2} = 2 \text{ marks}$
5. Signs of anthrax
  - Lack of rigor mortis.
  - Dark red blood oozing out through the natural openings;
  - Non clotting blood;
  - Bloated / swollen stomach.  $3 \times \frac{1}{2} = 1\frac{1}{2} \text{ marks}$
6. Control of cannibalism
  - Debeaking perpetual cannibals;
  - Use of battery, cage system;
  - Laying boxes being as dark as possible;
  - Dim light in poultry houses;  $4 \times \frac{1}{2} = 2 \text{ marks}$
7. Intermediate hosts
  - a) Tapeworm - pig; cattle.
  - b) Liver fluke - mud snail / water snails.  $2 \times 1 = 2 \text{ marks}$
8. Cattle susceptible to milk fever
  - Heavy milking cows / high yielding cows.
  - Animals fed on feeds lacking calcium.
  - Cows at 3rd - 4th lactation.
  - Cows which had past cases of milk fever.  $2 \times 1 = 2 \text{ marks}$
9. When to prepare artificial colostrums
  - Death of mother cow after birth.
  - Absence of a foster mother.
  - Mother cow having been milked upto four days prior to parturition  $2 \times 1 = 2 \text{ marks}$
10. Uses of gears
  - Provide different forward speeds.
  - Enable reversing.
  - Allows tractor stopping without switching off the engine.  $2 \times 1 = 2 \text{ marks}$
11. Tools to lay concrete blocks
  - Spirit level.
  - Plumb bob / plumb line.
  - Mason's square / tape measure.
  - String / line / masons hammer.
  - Masons chisel / bolsters;  $4 \times \frac{1}{2} = 2 \text{ marks}$
12. State four characteristics of clean milk
  - Free from pathogens.
  - Of standard chemical composition;
  - No physical dirt (like hairs, dust, dung)
  - Good milk flavour.
  - High keeping quality.  $4 \times \frac{1}{2} = 2 \text{ marks}$
13. Maintenance of cross cut saw
  - Proper storage after use.
  - Oil the blade to avoid rusting.
  - Sharpen the teeth;

- Set the teeth properly.
  - Tighten the handle screws if loose / replace broken handles;  $3 \times \frac{1}{2} = 1\frac{1}{2}$  marks
- 14. Causes of grass staggers**
- Magnesium deficiency  $1 \times 1 = 1$  mark
- 15. i)** Incubation period - Time from entry of disease germ (pathogen) to the time symptoms show up  
**ii)** Mortality rate - likelihood of death to occur in the herd in case of disease infection.  $2 \times 1 = 2$  marks
- 16. Chemical causes of diseases**
- If an animal eats, swallow or inhales chemicals like acids, alkalis, insecticides and herbicides it can be poisoned.
  - Stings from certain insects insensitive parts of the body can cause;
  - Some weeds in pasture are poisonous if eaten by animal, for example  
*Thorn apply (Datura stramonium);*  $2 \times 1 = 2$  marks

**17. Give three parts of a building**

- Foundation
- Walls
- The roof

**SECTION B (20 marks)**

- 18. a)** Ascariasis;  $1 \times \frac{1}{2} = \frac{1}{2}$  mark
- b)** Reasons
- Presence of adult worms
  - Presence of eggs of the worms
  - Haemorrhage on the intestines.
  - Presence of cysts.  $4 \times \frac{1}{2} = 2$  marks
- c) Worms control methods**
- Routine drenching.
  - Maintain proper hygiene
  - Practise rotational grazing.
  - Burning of grazing pastures.  $4 \times \frac{1}{2} = 2$  marks
- 19. a)** Induction stroke  $1 \times 1 = 1$  mark
- b)** Petrol engine  $1 \times 1 = 1$  mark
- c)** Presence of spark plug  $1 \times 1 = 1$  mark
- d)** Compression stroke, followed by power stroke.  $2 \times \frac{1}{2} = 1$  mark
- e)** Diesel engine  $1 \times 1 = 1$  mark
- 20. a)** m;  $1 \times \frac{1}{2} = \frac{1}{2}$  mark
- b)** 8 - 10 minutes  $1 \times \frac{1}{2} = \frac{1}{2}$  mark
- c) Preparation before milking**
- Bringing the animal to the milking stall.
  - Provide feed in the feed trough.
  - Secure the animal's hind legs properly.
  - Wash the animal's udder.
  - Wipe the udder with a clean cloth.
  - For mastitis using a strip cup
  - Milk the animal;  $6 \times \frac{1}{2} = 3$  marks
- d) Post milking practices**
- Weighing and recording milk
  - Sieving the milk.
  - Cooling the milk  $2 \times \frac{1}{2} = 1$  mark
- 21. a)** Rotational grazing.  $1 \times \frac{1}{2} = \frac{1}{2}$  mark
- b)** Sequence of rotation.
- NB: Arrows must be continuous in one direction:  $1 \times 1 = 1$  mark
- c)** A is water trough  $1 \times 1 = 1$  mark
- d)** A is at the centre to make water available to livestock grazing in all paddocks.  $1 \times 1 = 1$  mark
- e) Advantages of rotational grazing**
- Livestock make maximum use of pastures.
  - Reduces the build-up of pest and diseases.
  - Animals waste is distributed evenly in all fields or paddocks.
  - Pastures area is given time to re grow before it is grazed on again.
  - Excess pasture can be harvested for conservation.
  - It is possible to apply fertilizers in parts of the pasture which are not in use.
  - Reseeding and weeding can be done when livestock leaves a paddock for another.

**SECTION C (40 marks)**

- 22. a) Explain the measures taken to prevent occurrence of livestock diseases.**
- Deworming to control internal parasites:
  - Rearing disease resistant breed of livestock; e.g. Zebu are resistant to ECF
  - Proper nutrition by providing a balanced diet to avoid deficiency diseases.

- Use of healthy breeding stock of AI;
- Control of disease vectors e.g. tsetse fly
- Vaccinating health animals before infection to create immunity against specific diseases; e.g. foot and mouth, black quarter;
- Mass slaughter / culling of animals suffering from zoonotic diseases like anthrax; rinderpests.
- Quarantine to prevent animal movement into or out of disease outbreak areas:
- Isolation of sick animals to prevent spread of contagious diseases.
- Use of antiseptics and disinfectants on equipments to kill pathogens.
- Administering prophylactic drugs to prevent infection.
- Feeding livestock on dry roughage before provide succulent roughage to prevent bloat,
- Hoof trimming to minimise occurrence of foot rot disease.
- Proper housing to prevent pneumonia.  $10 \times 1 = 10 \text{ marks}$

**b) Side effects of livestock diseases:**

- Reduce market value of livestock.
- Spread diseases to man e.g. anthrax and brucellosis.
- Reduce the quality of products e.g. mastitis reduce quality of milk.
- Shorten productive life of an animal.
- High mortality rate.
- Lowered production.
- Some like vaginitis cause infertility.  $5 \times 1 = 5 \text{ marks}$

**c) Ways of diseases spread.**

- Contaminated feeds and water.
- Insect vectors and contaminated equipments.
- Contact with affected animals.
- Open wounds.
- Inhalation of pathogens.
- Mating.
- Suckling of young ones by dams.
- During parturition / kidding / lambing / delivery.  $5 \times 1 = 5 \text{ marks}$

**23. a) Differences between *Bostaurus* and *Bos indicus*.  $10 \times 1 = 10 \text{ marks}$**

**b) Advantages of battery cage system in poultry rearing. (10 marks)**

- Eggs produced remain clean
- Broodiness is discouraged.
- High stocking rate /many birds in a unit area.
- Feed and water are not contaminated.
- vices like cannibalism and egg eating are reduced.
- Individual records of egg laying can be kept
- More eggs are produced per bird.
- The system requires low labour.
- Is easy to clean and disinfect.
- Sick birds are easily identified and treated.
- Feeding and watering can be mechanised
- Different classes / ages of birds can be kept
- Less spread of diseases and parasites from a bird to others.
- It is easy to handle birds during routine management practices.
- Culls / culled birds have tender meat.  $10 \times 1 = 10 \text{ marks}$

**24. a) Siting factors for farm structures**

- The location of the homestead; homestead should be sited at a point that give it panoramic view;
- Accessibility - to most part of the farm.
- Security - housing structure should be sited at safe place to avoid theft of livestock.
- Drainage, the area should have good drainage to avoid flooding.
- Direction of the prevailing wind - structures like latrines should be sited on the leeward side of homestead to avoid foul smell in the houses.
- Relationship between structures - related structures like milking parlour and calf pen should be near one another to save time.
- Farmer's taste and preference influence site of a structure like homestead away from the roads.
- Proximity of structure to existing amenities like water supply and electricity;
- Topography of the area - a slopy ground make construction of a building very expensive due to levelling
- Future expansion - should have free space for extension  $10 \times 1 = 10 \text{ marks}$

**b) Factors that influence selection of construction materials.**

- Availability of materials - select construction materials that are locally /readily available.
- Cost of the materials - select material that are cheapest as long as they meet other qualifications.
- Suitability of the materials to drainage of floor - keep off rain - light the room and temperature regulation
- Suitability of materials to the prevailing weather conditions.
- Durability of materials to reduce cost of repairs and maintenance

**BUSIA COUNTY JOINT EXAMINATION**

443/1

**AGRICULTURE**

Paper 1

July/August 2015

**SECTION A : (30 MARKS)**

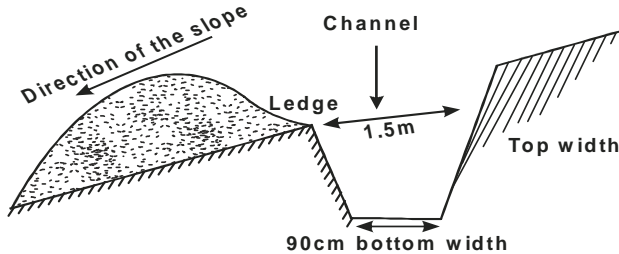
*Answer all the questions in this section in the spaces provided.*

1. Name the part planted for each of the following crops :
  - a) Sisal ..... (½ mark)
  - b) Pyrethrum ..... (½ mark)
  - c) Irish potato ..... (½ mark)
2. State four biotic factors that influence crop production. (2 marks)
3. Name four methods of controlling rodent crop pests. (2 marks)
4. State four ways of conserving water on the farm. (2 marks)
5. Name four farm records that should be kept by a maize farmer. (2 marks)
6. State four disadvantages of using organic manure in vegetable production. (2 marks)
7. Give two ways in which pastures are classified based on altitude. (1 mark)
8. State four advantages of organic mulches. (2 marks)
9. Give five factors influencing crop rotation. (2½ marks)
10. State two reasons of earthing up in maize production. (1 mark)
11. Give four harmful effects of weeds on crop production. (2 marks)
12. State three disadvantages of shifting cultivation. (1½ marks)
13. Give five advantages of rotational grazing in dairy farming. (2½ marks)
14. State four post harvesting practices carried out in beans. (2 marks)
15. State four reasons for land registration. (2 marks)
16. Give four factors that influence the choice of tools used in seedbed preparation. (2 marks)

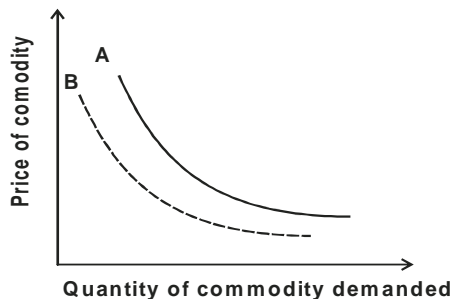
**SECTION B :**

*Answer all the questions in this section in the spaces provided.*

17. The illustration below shows a structure used for controlling soil erosion. Study it carefully and answer the questions that follow.

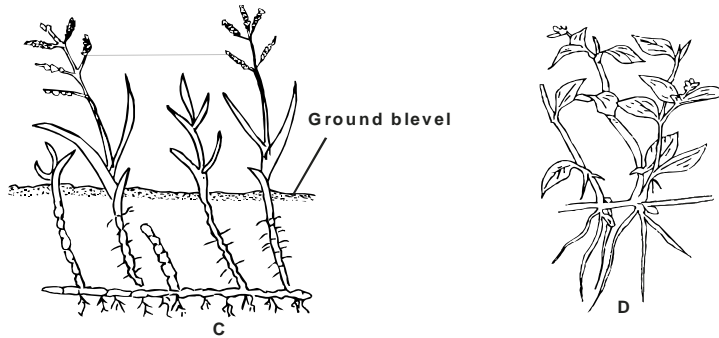


- a) Identify the structure. (1 mark)
  - b) Explain two ways in which the structure helps to control soil erosion. (2 marks)
18. The diagram below illustrates the law of demand in agricultural marketing. Study it and answer the questions that follow.



- a) Give a reason for the shape of the curve labelled A. (1 mark)
- b) If the price of the commodity remains constant, explain three factors that can cause the curve to shift from A to B. (3 marks)

19. The diagrams below illustrates common weeds in arable land. Study them carefully and answer the questions that follow.

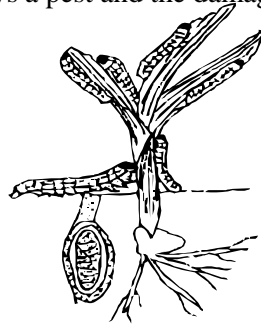


- Identify the weed labelled D. (1 mark)
  - Classify the weed labelled C according to plant morphology. (1 mark)
  - Give one reason why it is difficult to control the weed labelled D. (1 mark)
20. The diagram below illustrates an agroforestry practice. Study it and answer the questions that follow.

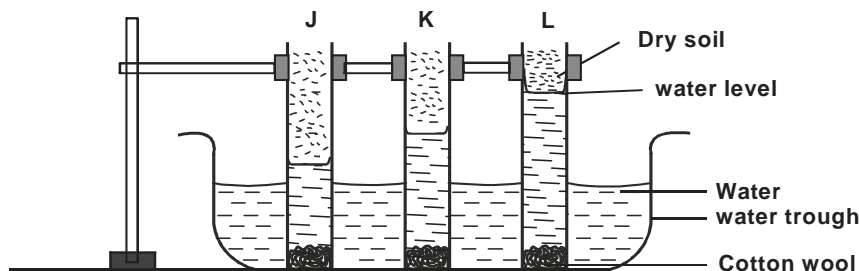


- Identify the agroforestry practice illustrated above. (1 mark)
- Explain three benefits of the practice illustrated above. (3 marks)

21. The diagram below shows a pest and the damaged crop. Study it and answer the questions that follow.



- Identify the crop pest illustrated above. (1 mark)
  - Explain two ways of controlling the pest. (2 marks)
22. The diagram below illustrates an investigation on a property of soil using soil samples labelled J, K and L.



- If the levels of water shown in the diagram were observed after three hours, name the property of soil being investigated. (1 mark)
- What is the relationship between the soil property named in (a) above and the size of soil particles? (1 mark)
- Which soil sample would be suitable for growing paddy rice? (1 mark)

**SECTION C : (40 MARKS)****Answer any two questions from this section in the spaces provided after question 25.**

23. a) Explain five factors that should be considered in farm budgeting. (10 marks)  
b) Describe the transplanting of tomato seedlings. (10 marks)
24. a) Explain five management practices in a vegetable nursery. (5 marks)  
b) Explain six factors that should be considered when selecting a vegetative planting material. (6 marks)  
c) Explain the different ways in which each of the following environmental factors influence crop production :  
i) Light (4 marks)  
ii) Rainfall (5 marks)
25. a) Outline the information contained in an invoice. (5 marks)  
b) Describe the harvesting of sugarcane. (6 marks)  
c) Explain the importance of drainage in crop production. (5 marks)  
d) Describe the role of phosphorus in crop production. (4 marks)

**BUSIA COUNTY JOINT EXAMINATION**  
**443/2**  
**AGRICULTURE**  
**Paper 2**  
**July/August 2015**

**SECTION A : (30 MARKS)**

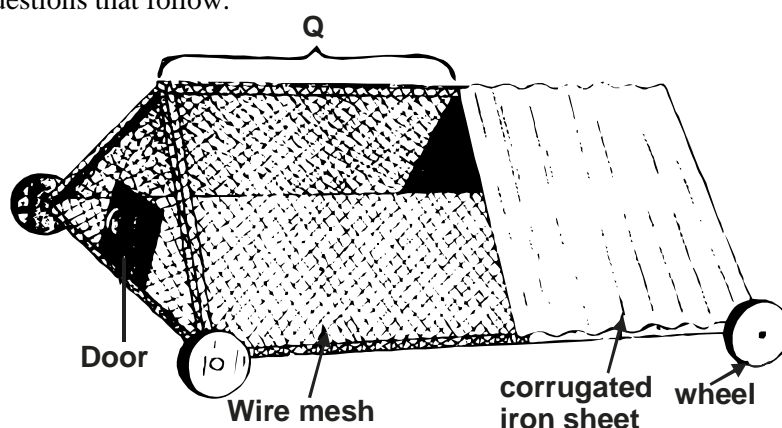
**Answer all the questions in this section in the spaces provided.**

1. State **four** uses of pliers on the farm. (2 marks)
2. Outline **four** characteristics of zebu cattle breeds. (2 marks)
3. a) Define the term “**digestibility**” as used in livestock nutrition. (1 mark)
- b) State two factors that affect the digestibility of a food material. (1 mark)
4. State **four** factors that predispose livestock to diseases. (2 marks)
5. State **four** non-chemical methods of controlling ticks on the farm. (2 marks)
6. State **four** characteristics to be considered when selecting a heifer for milk production. (2 marks)
7. Name the **two** main systems of breeding in livestock production. (1 mark)
8. State **three** specialised feeding programmes in livestock production. (1½ marks)
9. State **three** reasons for hoof trimming in sheep rearing. (1½ marks)
10. Name **three** components of a truss on the roof of a building. (1½ marks)
11. Name the **two** types of bacterial diseases in cattle that are controlled by the administration of blanthrax vaccine. (1 mark)
12. State the **four** main symptoms of contagious bovine pleuropneumonia in calves. (2 marks)
13. Name **two** vices in poultry rearing. (1 mark)
14. State **two** reasons why calves should be housed singly in a calf pen. (1 mark)
15. State **four** maintenance practices on a disc plough. (2 marks)
16. Name a component on a tractor used for each of the following :
  - a) Checking the level of oil in the sump (½ mark)
  - b) Connecting and disconnecting the drive shaft to or from the engine. (½ mark)
  - c) Regulating the temperature of water in the cooling system. (½ mark)
  - d) Stepping up the battery voltage from 12 volts to about 6000 volts. (½ mark)
17. Name **three** farm implements operated by the tractor’s P.T.O shaft. (1½ marks)
18. State **four** main methods of preserving fish after harvesting. (2 marks)

**SECTION B : (20 MARKS)**

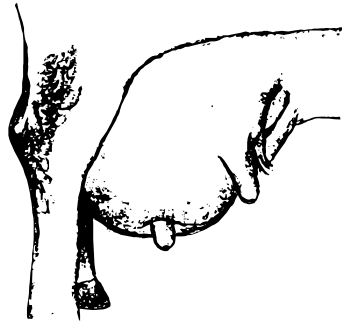
**Answer all the questions in this section in the spaces provided.**

19. The illustration below shows a structure used in raising poultry under a certain rearing system. Study it and answer the questions that follow.

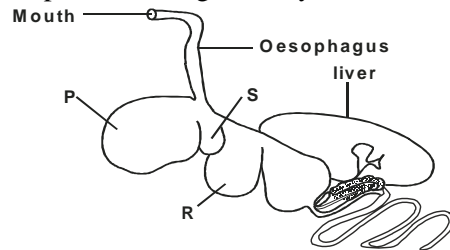


- a) Identify the system of poultry rearing illustrated above. (1 mark)
- b) Give the appropriate measurements for the structure that can accommodate between 10-15 hens. (1 mark)
- c) State the main function of the region marked Q on the structure. (1 mark)
- d) What is the importance of moving the structure daily to a fresh ground ? (2 marks)

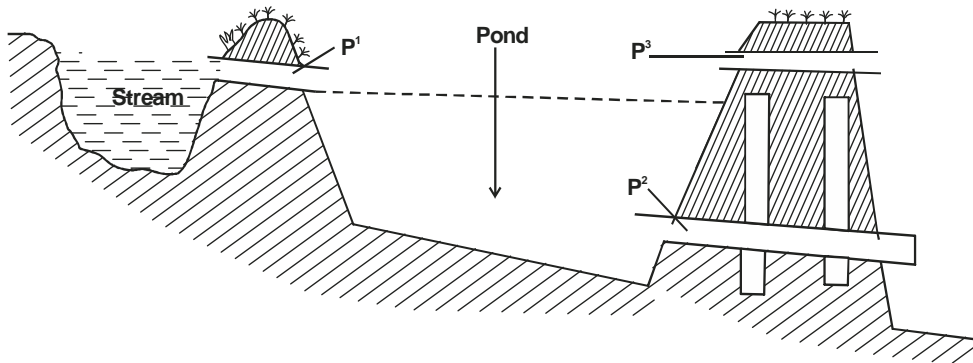
20. The illustration below shows a dairy cow suffering from a certain disease.



- a) Identify the disease the cow could be suffering from. (1 mark)  
 b) State **two** symptoms of the disease named above. (2 marks)  
 c) State any **two** predisposing factors to the above disease. (2 marks)
21. The illustration below shows part of the digestive system of a cow. Study it carefully and answer the questions that follow.



- a) Identify the part labelled R on the diagram. (1 mark)  
 b) Which of the parts labelled is also referred to as :  
 i) the “**book of many plies**” ? (½ mark)  
 ii) the “**honey comb**” ? (½ mark)  
 c) State **two** microbial activities that take place in the chamber labelled P ? (2 marks)  
 d) State the role of oesophageal groove in ruminants. (1 mark)
22. The illustration below shows a cross section of a fish pond.



- a) Identify the features on the pond labelled **P<sub>1</sub>** and **P<sub>3</sub>** (2 marks)  
 b) State the role of the part labelled **P<sub>2</sub>** (1 mark)  
 c) A screen of fine mesh is usually placed at **P<sub>1</sub>** and **P<sub>2</sub>**. State the main function of the screens at : (2 marks)

### **SECTION C : (40 MARKS)**

*Answer any two questions in this section in the spaces provided.*

23. a) Describe the process of egg formation in the reproductive system of a hen. (10 marks)  
 b) Outline the procedure followed when hand spraying cattle to ensure effective use of the acaricide to control ticks. (10 marks)
24. a) What are the advantages of farm mechanisation ? (5 marks)  
 b) Explain the differences between a two stroke and a four stroke cycle engines. (5 marks)  
 c) Explain the advantages of the Kenya Top Bar beehive in rearing bees. (10 marks)
25. a) Describe the lifecycle of named tapeworm (Taenia spp) (10 marks)  
 b) Discuss five factors that determine the amount of maintenance ration an animal should be given. (10 marks)



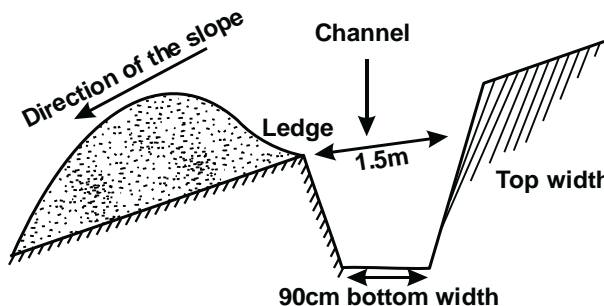
**BUSIA COUNTY JOINT EXAMINATION***Kenya Certificate of Secondary Education***AGRICULTURE****Paper - 313/1****MARKING SCHEME**

1. Name the part planted for each of the following crops:
  - Bulbil/sucker (½ mark)
  - Splits (½ mark)
  - Stem tuber (½ mark)
2. State four biotic factors that influence crop production.
  - Pests
  - Parasites
  - Decomposers
  - Pathogens
  - Predators
  - Pollinators
  - Nitrogen fixing bacteria (4 x ½ = 2mks)
3. Name four methods of controlling rodent crop pests.
  - Trapping & killing
  - Poisoning
  - Rearing cats
  - Physical killing
  - Physical barriers e.g chain link fence (4 x ½ = 2mks)
4. State four ways of conserving water on the farm.
  - Use of Tanks
  - Use of ponds
  - Use of canals/trenches
  - Use of terraces
  - Mulching (4 x ½ = 2mks)
5. Name four farm records that should be kept by a maize farmer.
  - Inventory
  - Field operation record
  - Labour records
  - Muster roll (4 x ½ = 2mks)
6. State four disadvantages of using organic manure in vegetable production
  - Release nutrients slowly
  - Leads to forking in carrots
  - They are bulky
  - They take long time for preparing
  - Do not supply all required nutrients (4 x ½ = 2mks)
7. Give two ways in which pastures are classified based on altitude
  - Low altitude
  - Medium altitude
  - High altitude (2 x ½ = 1mks)
8. State four advantages of organic mulches.
  - Smoothers weeds
  - Rotten mulches release nutrients
  - Conserve moisture
  - Moderates soil PH.
  - Moderates soil temperature (4 x ½ = 2mks)
9. Give five factors influencing crop rotation
  - Crop root depth
  - Crop nutrient requirement
  - Weed control
  - Pest and disease control
  - Soil fertility
  - Soil structure (5 x ½ = 2½mks)
10. State two reasons of earthing up in maize crop production

- Offer support to prevent lodging
  - Improves drainage in clay soils (2 x ½ = 1mks)
11. Give four harmful effects of weeds on crop production
- Compete crops for nutrients.
  - Some are parasitic
  - Low quality of products
  - Some are alternate hosts of pests
  - Allelopathic. (4 x ½ = 2mks)
12. State three disadvantages of shifting cultivation
- Total yield per unit area is low
  - A lot of time is wasted in shifting
  - Farmers have no incentives to develop the land.
  - Not applicable in high population density (3 x ½ = 1½mks)
13. Give five advantages of rotational grazing in dairy farming.
- Livestock make maximum use of pasture.
  - Reduces the build up of pests and diseases.
  - Animal waste is distributed evenly in all fields
  - Pasture is given time to regrow
  - Excess pasture can be harvested for conservation
  - It is possible to apply fertilizers in parts of pasture (5 x ½ = 2½mks)
14. State four post harvesting practices carried out in beans
- Threshing
  - Drying
  - Sorting and grading
  - Dusting
  - Packaging
  - Branding (4 x ½ = 2mks)
15. State four reasons for land registration
- To establish ownership of land
  - Title can be used to secure credit
  - Land disputes are minimised
  - It encourages farmers to invest / long term investment
  - Enables land owner to lease part or whole land.
  - Enables land owner to sell part or whole land. (4 x ½ = 2mks)
16. Give four factors that influence the choice of tools used in seedbed preparation
- The condition of the land
  - The type of tillage required
  - Depth of cultivation
  - Capital availability (4 x ½ = 2mks)

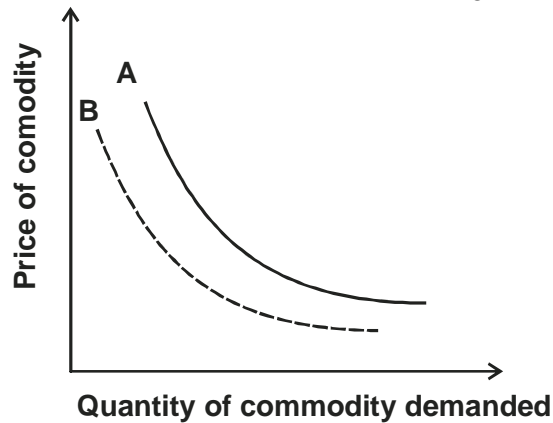
### **SECTION B**

Answer all the questions in this section in the spaces provided

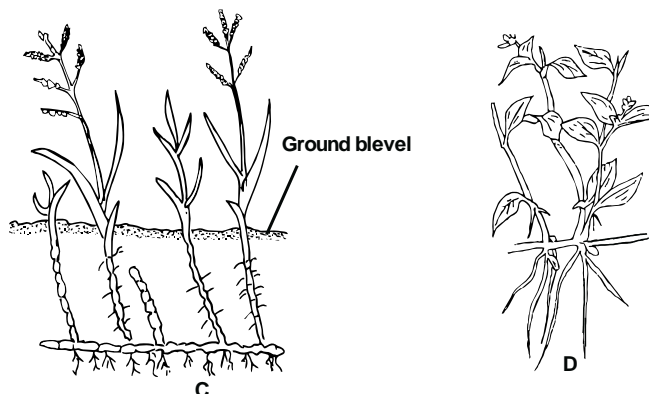


- 17 a) Identify the structure (1 mark)
- A bund
- b) Explain two ways in which the structure helps to control soil erosion. (2 x ½ = 2mks)
- Reduce the speed of running water.
  - Trap soil in the running water.

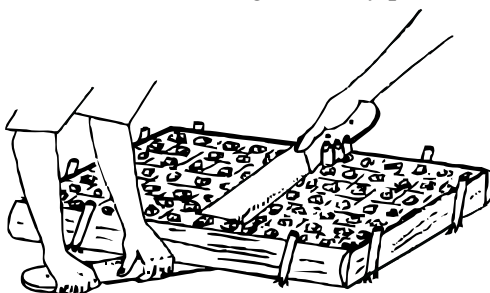
18. The diagram below illustrates the law of demand in agricultural marketing. Study it and answer the questions that follow



- a) Give a reason for the shape of the curve labelled A.  
 - As the price of the commodity increases the quantity demanded decreases and vice versa. (1 x 1 = 1mk)
- b) If the price of the commodity remains constant, explain three factors that can cause the curve to shift from A to B.  
 - Decrease in income of consumers  
 - Lack effective advertisement  
 - Decrease in price of related good  
 - Decrease in population  
 - Lowering of quality (3 x 1 = 3mks)
19. The diagrams below illustrates common weeds in arable land. Study them carefully and answer the question that follow.



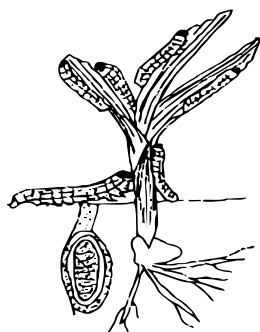
- a) Identify the weed labelled D. (1mark)  
 Wondering Jew (*Commelina benghalensis*)
- b) Classify the weed labelled C according to plant morphology (1 mark)  
 - Narrow leaved plant
- c) Give one reason why it difficult to control the weed labelled D. (1 x 1 = 1mk)  
 - Remain in soil for long.  
 - Propagate vegetatively.
20. The diagram below illustrates an agroforestry practice. Study it and answer the question that follow



- a) Identify the agroforestry practice illustrated above.  
 - Root/pruning/trimming (1 x 1 = 1mk)
- b) Explain three benefits of the practice illustrated above.  
 - Make lifting easy.

- Reduce chance of damaging seedling during transplanting
- Seedlings established faster

21. The diagram below shows a pest and the damaged crop. Study it and answer the question that follow:



- a) Identify the crop pest illustrated above.
- Army worm (1 mark)
- b) Explain two ways of controlling the pest
- Spraying with insecticides
  - Flooding (2 x 1 = 2mks)

22.

- a) If the levels of the water shown in the diagram were observed after three hours, name the property of soil being investigated.
- Soil capillarity (1 mark)
- b) What is the relationship between the soil property named in (a) above and the size of soil particles?
- The smaller the size of the particles the greater the force of capillary. (1 mark)
- c) Which soil sample would be suitable for growing paddy rice?
- L (1 mark)

### **SECTION C (40 marks)**

*Answer any 2 questions from this section in the spaces provided.*

23

- a) Factors considered in farm budgeting
- Size of the farm this will help in determining the budget i.e avoiding over expenditures.
  - Current trends in labour market which enables the farmer to plan ahead.
  - Sources of credit and availability of farm inputs.
  - Farmers objectives and preferences.
  - Security to avoid incurring losses by the farmer. (5 x 2 = 10mks)

b) Transplanting of tomato seedlings.

- Should be done when seedlings are pencil size thick/one month old.
- Water nursery.
- Use garden trowel to lift.
- Apply appropriate pesticide in hole.
- Lift only healthy seedlings
- Plant one seedling per hole
- Should be done in the evening
- Provide temporary shed
- Water the seedling daily.
- Place soil around seedling and firm it.
- Holes dug are spaced to 100 x 50 - 60cm.
- Transport on the onset of rainfall.
- Planting holes should be dug 15 cm deep.
- Transport seedlings carefully. (10 x 1 = 10mks)

24

a) Management practices in a vegetable:

*Nursery;*

- Watering to give moisture.
- Shading to prevent excess heat.
- Pricking out to reduce congestion.
- Roguing to control diseases.

- Spraying with appropriate pesticides to control pests.
  - Spraying fungicide to control fungal disease. (5 x 1 = 5mks)
- b) Factors considered when selecting vegetative planting materials;
- Suitability to the ecological conditions.
  - Free from disease.
  - Free from pests.
  - Ability to germinate.
  - Keeping quality.
  - Mother plants characteristics.
  - Size the vegetative material. (6 x 1 = 6mks)
- c) i) Light;
- Rate of photosynthesis increase with light intensity.
  - Inadequate light leads to seedlings etiolation.
  - Light affect flowering and seed formation in non -day neutral plants.
  - Plant chlorophyll absorb light of certain wave length. (4 x 1 = 4mks)
- ii) Rainfall;
- It is the main source of water for plants.
  - Lack of water leads to wilting in plants.
  - Rainfall reliability determine the time of land preparation and planting.
  - Amount of rainfall determine types of crop to be grown.
  - Rainfall distribution influences choice of crop varieties growing in a given area.
  - Rainfall intensity, very high rainfall intensity damages crops and causes soil erosion. (5 x 1 = 5mks)
- 25 a) Invoice information;
- Date of transaction.
  - People involved in transaction.
  - Type and quantities of goods delivered.
  - Price per unit of goods.
  - Total amount of money involved.
  - Invoice serial number.
  - Terms of payment. (5 x 1 = 5mks)
- b) Harvesting of sugarcane;
- Sugar-cane mature 18 -20 months whereas ratoon take 16 months in Western. Coast take 14 months and ratoon take 12 months.
  - Sampler should be taken for quality testing in the factory.
  - If the quality is ok harvesting should start immediately.
  - Cut the cane at the ground level to avoid loss of the yield.
  - After cutting cane the green tops are removed immediately.
  - The leaves should be stripped.
  - Harvesting is done using a cane harvesting matches.
  - Harvested cane should be delivered to the factory within the first 24hours. (6 x 1 = 6mks)
- c) Importance of drainage;
- To increase soil aeration.
  - To increase soil volume.
  - To raise soil temperature.
  - To increase microbial activities.
  - To reduce soil erosion.
  - To remove toxic substances. (5 x 1 = 5mks)
- d) Role of phosphorus;
- Root development.
  - Essential for flowering, fruits and seed. formation hastens ripening of fruits.
  - Play role in metabolic processes.
  - It is part of nucleoproteins.
  - Strengthens plant stems preventing lodging. (4 x 1 = 4mks)

**BUSIA COUNTY JOINT EXAMINATION***Kenya Certificate of Secondary Education***AGRICULTURE****Paper - 313/2****MARKING SCHEME**

1. Uses of pliers on the farm.
  - Cutting & splicing thin wires.
  - Tightening & loosening nuts & bolts.
  - Removing small nails from wood.
  - Holding objects firmly where a strong grip is needed. (4 x ½ = 2marks)
2. Characteristics of zebu cattle breeds.
  - Are humped.
  - Can withstand high temperatures.
  - Grow slowly hence mature faster.
  - Resistant to many tropical diseases & tsetsefly infection.
  - Are hardy/can survive under unfavourable condition e.g poor pastures.
3. Digestibility - is the proportion of food that is retained in the animals body after loses through urine, faeces & gases. (1mk as a whole)
- b) Factors affecting digestibility of a food materials.
  - Form in which food is offered to the animal.
  - Chemical composition of the feed.
  - Species of the animal.
  - Ratio of energy to proteins in a feed.
  - Quantity of food already present in the digestive system of the animal. (2 x ½ = 1mark)
4. Factors that pre-dispose livestock to diseases.
  - Species of the animal.
  - Sex of the animal.
  - Age of the animal.
  - Colour of the animal.
  - Breed of the animal.
  - Size of the herd
  - Hereditary/genetic factors.
  - Body shape/conformation.
  - Animal movement.
  - Abrupt change in weather. (4 x ½ = 2mks)
5. Non-chemical methods of controlling ticks.
  - Burning of old and infested pastures to kill their stages.
  - Fencing off pasture land to keep off alternate hosts.
  - Rotational grazing to starve some stages to death.
  - Hand picking and killing them/deticking.
  - Ploughing pastures to expose or burry eggs.
  - Top dressing pastures using lime.
  - Use of tick's natural enemies to predate on them/biological agents. (4 x ½ = 2marks)
6. Characteristics considered when selecting a heifer for milk production.
  - Wedge shape/triangular.
  - Calving interval shorter.
  - Butter fat content/quality of milk - Good butterfat content.
  - Milk yield/production level - High milk production potential.
  - Fast growth rate.
  - Mature and right body weight; (4 x ½ = 2marks)
7. Main systems of breeding.
  - Inbreeding
  - Out breeding (2 x ½ = 1mark)
8. Specialized feeding programme in livestock production.
  - Flushing/feeding around service time with high nutritive feeds/3-4 weeks to service;
  - Steaming up/feeding during the last weeks of gestation with high nutritive feeds/2 months to parturition.
  - Creep feeding/feeding of young animals from birth to weaning. (3 x ½ = 1½marks)
9. Reasons for hoof trimming in sheep rearing.

- To facilitate easy movement.
  - To control food rot disease.
  - To prevent rams from injuring owes during tapping. (3 x ½ = 1½marks)
10. Components of a truss
- Tie/beam/cross tie.
  - Two rafters.
  - Struts. (3 x ½ = 1½marks)
11. Types of bacterial diseases controlled by the administration of blanthrax vaccine.
- Black quarter.
  - Anthrax. (2 x ½ = 1mark)
12. Symptoms of CBPP.
- Nasal mucous discharge.
  - Rapid breathing.
  - Congestion of bronchioles hence coughs when chest is pressed.
  - Abnormal lung sounds/hissing, gurgling & bubbling.
  - Fluctuating body temperature. (4 x ½ = 2marks)
13. Vices in poultry.
- Cannibalism/vent/toe pecking.
  - Egg eating. (2 x ½ = 1mark)
14. Reasons why calves should be housed singly.
- To avoid licking each other/formation of hair balls in the rumen.
  - To avoid spread of worms an diseases.
  - To avoid spread of parasites. (2 x ½ = 1mark)
15. Maintenance practices on a disc plough
- Lubricate the hubs & furrow wheel bearings.
  - Clean the implement after the day's work.
  - Repair broken discs immediately.
  - Sharpen discs when they become blunt.
  - Tighten loose nuts and bolts.
  - Smear unpainted surfaces with old engine oil during long storage. (4 x ½ = 2marks)
16. a) Dip stick (½mark)  
 b) Clutch (½mark)  
 c) Thermostat (½mark)  
 d) Ignition coil (½mark)
17. Implements operated by the tractors P.T.O shaft.
- Mowers.
  - Shellers.
  - Rotavators/rotary tillers.
  - Forage harvesters. (3 x ½ = 1½marks)
18. Methods of preserving fish after harvesting.
- Freezing in deep freezers.
  - Salting/Briming.
  - Sun drying.
  - Smoking in a smoking pit. (4 x ½ = 2 marks)
19. a) Fold/Ark  
 b) 3.5m long x 1.5m wide x 1.5m high.  
 c) For exercising and sunning.  
 d) To reduce build-up of diseases.  
 - To provide fresh grass.  
 - To avoid accumulation of droppings/ spread manure evenly.
20. a) Mastitis  
 b) Pus, blood, thick clots in milk or milk turns watery.  
 - Inflamed/swollen udder hence animal rejects suckling or milking and kicks due to pain.  
 - Death of the infected quarter.  
 - Salty taste in milk  
 c) - Age.

- Stage of lactation.
  - Udder attachment.
  - Incomplete milking.
  - Poor milking techniques.
  - Mechanical injuries.
- 21 a)-Omasum
- b) i) R  
ii) S
- c)
- Fermentation of food.
  - Synthesis of vitamin B-complex and vitamin K.
  - Synthesis of amino acids from ammonia.
  - Breakdown of proteins to peptides.
  - Breakdown of carbohydrates and cellulose to carbon (iv) oxide and volatile fatty acids.
- d)- Allows movement of food from the mouth to the reticulum.
- 22 a) P<sub>1</sub> - Inlet pipe (1 x 1 = 1mk)  
P<sub>3</sub> - Spill way pipe (1 x 1 = 1mk)
- b) Drains the pond during harvesting and maintenance. (1 x 1 = 1mk)
- c) P<sub>1</sub> -Prevent entry of undesirable fish species and foreign materials into the pond. (1 x 1 = 1mk)  
P<sub>2</sub> - Prevent fish from swimming away from the pond. (1 x 1 = 1mk)
23. Process of egg formation in the reproductive system of a hen.
- Ovary - produce the ovum/yolk.
  - Funnel/Infundibulum -chalaza added to the yolk
  - receives ovum
  - stores sperms
  - fertilization takes place here
  - Magnum - thick albumen added to the egg.
  - Isthmus - shell membranes added to the egg.
  - water, mineral salts & vitamins added to the egg.
  - Uterus/shell gland - addition of albumen completed.
  - Shell & shell pigments added to the egg.
  - Vagina - stores egg temporarily before laying;
  - egg is inverted to be laid with the broad end first;
  - egg is lubricated;
  - Cloaca - exit for the egg;
- (Mark correct part & function-ignore the order)*  
*Part Any 5 x 1 = 5marks*  
*Function of each part 5 x 1 = 5marks* *Total 10 marks*
- b) Procedure followed when hand spraying cattle to ensure effective use of the acaricide.
- Spray the entire back line from the shoulders to the tail end.
  - Spray the sides in a zigzag motion to trap and retain the dip wash from the back line.
  - Spray the belly with the nozzle facing upwards.
  - Spray the scrotum/udder and the hind flanks carefully.
  - Spray both hind legs up to and including the heels.
  - Spray the tail-head and the area around the anus& vulva.
  - Hold the tail switch onto the rump and spray it thoroughly to ensure complete wetting.
  - Spray the neck and the fore leg from the flanks to the heels.
  - Spray the head and face making sure that the bases of horns are thoroughly wetted.
  - Spray the inside of the ears. (10 x 1 = 10 marks) (Procedure must be correct)
- 24
- a) Advantages of farm mechanization.
- Farm operations can be achieved on time/saves time;
  - Large area can be covered within a short time.
  - Reduced drudgery/makes work easy and enjoyable.
  - Increased efficiency/better job done.
  - High yields are obtained since farm operations are carried out on time.
  - Uses less labour/les laborious.



- Farmers benefit from the economies of scale.
  - Encourage farmers to consolidate their land.
  - Pests and disease out-breaks can be controlled in relatively short time. (5 x 1 = 5marks)
- b) Differences between two-stroke and four-stroke cycle engines.

***Two stroke***

- Cheap to buy and maintain
- Produce less power/ do light work
- Uses more fuel and oil
- Mainly air cooled
- Easy to transport due to small size
- Require 2 complete up ward and down ward strokes
- One revolution of the crank shaft
- Simple in construction
- Has no valves instead ports
- Has no oil sump

***Four stroke***

- Expensive to buy and maintain
- Produce more power/do heavy work.
- Economical in fuel and oil use.
- Mainly water cooled
- Difficult to transport due to big size
- Require four complete strokes
- Two revolutions
- Complex in construction
- Has valves
- Has oil sump to lubricate the crank

- c) Advantages of the Kenya Top Bar Beehive in rearing bees. (10marks)

- High quality honey is harvested; queen excluder can be used to separate brood from other honey combs;
- Easy to check the condition of the honey combs; - Top bars are easily singly lifted and examined;
- Easy to construct and maintain; has simple design;
- Brood is not disturbed during harvesting of honey; the brood chamber is separated from the honey chamber.
- More honey is harvested per unit time.
- Allows easy time for worker bees to build their combs; Top bars direct them; (Any 5 x 2 = 10marks)

25

- a) The life cycle of a beef/pork tape worm.

- Mature segments/proglottids full of eggs are dropped with human faeces.
- Eggs are then released from the segments.
- Cattle/pig ingests the eggs during grazing/feeding.
- In the intestines, eggs hatch into embryos.
- Embryos penetrate the intestinal wall and enter the blood stream.
- From the liver, the embryos first localize in the liver.
- From the liver the embryos are transported to the muscles in the body.
- In the muscles they become cysts/bladder worms/*cysticercus cellulose/bovis*
- Human beings get infested when they consume raw or under cooked beef/pork with the cysts.
- In the human intestines, the cyst wall dissolves and the bladder worms emerge and attach to the intestinal wall.
- They then develop into adult worms and start laying.

*Mark until the order is broken)*

*First marking point - naming the tapeworm*

*Other marking points as per m/scheme*

*(10 x 1 = 10marks)*

- b) Factors that determine the amount of maintenance ration and animal should be given.

- Level of production - high producing animals/dairy cows require more food than low producers.
- Body size/weight of the animal - the larger the body size the more the amount of food and vice versa.
- Age of the animal - young animals require more food than mature animals for faster growth and development.
- Animal activity/purpose of the animal - active animals require more food than inactive ones/level of production.
- Environmental conditions - animals require more food in cold weather than in hot weather/ambient temperature;
- Physiological condition of an animal - pregnant animals require high amount of food than other for foetal development/sick animals; (Any 5 x 2 = 10mks)

**NYAKACH SUB COUNTY JOINT EXAMINATION***Kenya Certificate of Secondary Education***Paper - 443/1****AGRICULTURE****July/August 2015****SECTION A (30 marks)***Answer ALL questions in this section on the spaces provided.*

1. List **four** branches of agriculture that deal with livestock production. (2 marks)
2. Name the plant used for propagating the following crops. (2 marks)
  - i) Pyrethrum .....
  - ii) Sweet potato .....
  - iii) Sisal .....
  - iv) Pineapple .....
3. State **two** factors that may accelerate wind erosion. (1 mark)
4. Give **two** aspects of light that influence crop production. (1 mark)
5. Identify **three** types of records that are kept by both crop and
6. List **four** structural measures used in soil and water conservation. (2 marks)
7. Explain the meaning of the following terms as used in soil fertility. (2 marks)
  - a) Straight fertilizer
  - b) Side dressing
8. Give **two** chemicals that are used during softening of water. (1 mark)
9. List **two** tertiary operations carried out during land preparation. (1 mark)
10. Given that beans are planted at a spacing of 20cm × 15cm, calculate the plant population in a plot of land measuring 25m × 40m (2 marks)
11. Outline **four** reasons for land redistribution in Kenya. (2 marks)
12. Give **two** types of inventory records in the farm. (1 mark)
13. List **three** forms of Agroforestry. (1½ marks)
14. State **four** reasons for keeping financial records. (2 marks)
15. Below is a list of weeds found in the farm. Use them to answer the questions below.  
Wandering Jew, pigweed, Mexican Marigold, Sodom Apple, Couch Grass and Thorn Apple.
  - i) Name two narrow leaved weeds. (1 mark)
  - ii) Give two weeds that are poisonous. (1 mark)
  - iii) Identify two annual weeds from the above list. (1 mark)
16. List **four** types of product - product relationship in agricultural economics. (2 marks)
17. State **four** functions of Kenya Sisal Board. (2 marks)
18. State two methods that can be used to train crops in the field. (2 marks)

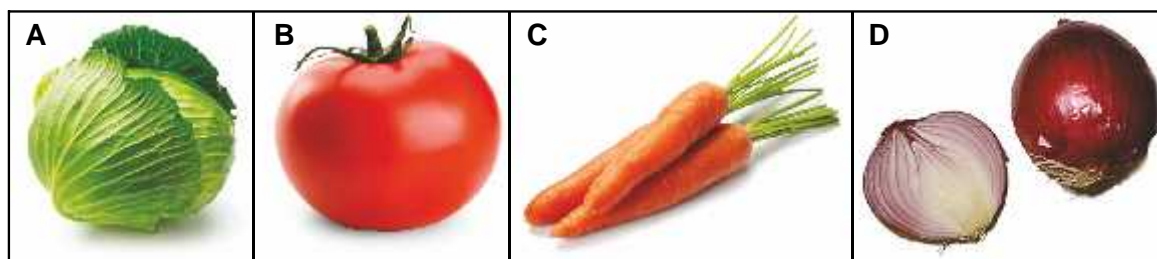
**SECTION B (20 marks)****Answer ALL questions in this section the spaces provided**

19. The diagram below is an illustration of a pest found within the farm.

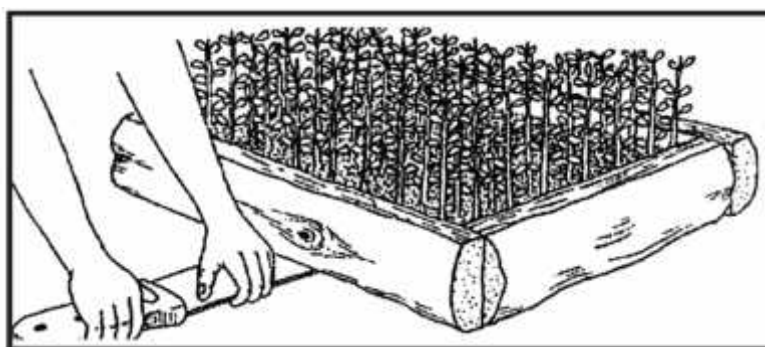


- a) Identify the pest. (1 mark)
- b) Give the type of mouth part of the best identified in (i) above. (1 mark)
- c) Name **two** viral diseases in crops that are transmitted by the above pest. (2 marks)

20. The diagrams below illustrates different types of vegetables.



- Identify the vegetables labelled C and D. (1 mark)
  - Name **two** later maturing variety of the vegetable labelled A. (2 marks)
  - List one physiological disorder that may affect the vegetable labelled B. (1 mark)
  - Identify the category of vegetable illustrated by letters A, B, C and D. (2 marks)
21. Below is an illustration of an activity carried out in Agroforestry.



- Identify the activity being carried out in the above diagram. (1 mark)
  - State two reasons for carrying out the activity identified in above. (2 marks)
  - Name two tools that may be used to carry out the activity in (a) above. (1 mark)
22. The diagram below illustrates a method of primary land preparation.



- Identify the method of primary land cultivation shown above. (1 mark)
- Name two implements apart from the one above that can be used during the method mentioned in (a) above. (1 mark)
- State two reasons for carrying out primary cultivation. (2 marks)
- List two other methods of primary cultivation besides the one illustrated. (2 marks)

**SECTION C (40 marks)**

Answer ANY TWO questions in this section in the spaces provided after question 25

23. a) Outline the negative effects of wind in crop production. (8 marks)  
 b) Describe the effects of diseases in tomato production. (4 marks)  
 c) State and explain the various methods of applying fertilizers in a crop field. (8 marks)
24. a) State **three** advantages and disadvantages of mechanical weed control. (6 marks)  
 b) Outline **six** importance of budgeting to the farmer. (6 marks)  
 c) On 20th February 2014, Kabete farm, P.O. Oboch in Upper Nyakach ordered the following items from Sondu Agrovat of P.O. Box 233 Sondu, using a Local Purchase Order (LPO) No. 0025
- |  |                  |
|--|------------------|
| Growers Mash 20 (50kgs) bags @ 1200              | = 24,000.00      |
| C.A.N fertilizer 8 (10 Kgs) bags @ 500           | = 4,000.00       |
| Bean seeds (Mwezi moja) 30 (2 kgs) packets @ 400 | = 12,000.00      |
| Dairy meal 4(90kg) bags at 1200                  | = 4,800.00       |
| Fungicide 10 litres @ 10,000                     | = 10,000.00      |
| Salt lick 20 blocks @ 2000                       | = 2,000.00       |
| Rakes 10 pieces @ 300                            | <u>=3,000.00</u> |
|  | 59,000.00        |
- Prepare a Local Purchase Order (LPO) that Kabete farm made to Sondu Agrovat. (8 marks)
25. a) State and explain five factors influencing crop rotation programme to be adopted by a farmer. (10 marks)  
 b) Outline ten reasons for draining agricultural land. (10 marks)

**NYAKACH SUB COUNTY JOINT EXAMINATION**

Kenya Certificate of Secondary Education

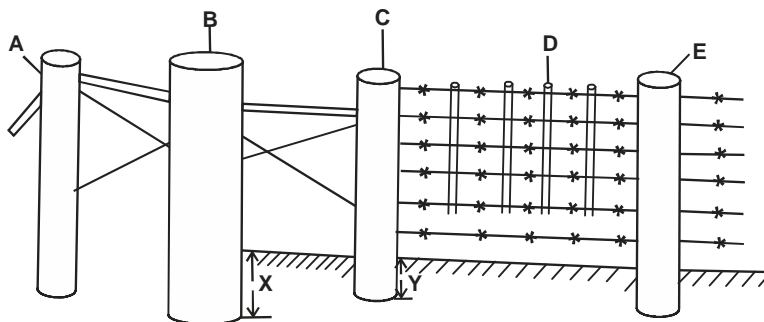
443/2

**AGRICULTURE****Paper 2****SECTION A (30 marks)***Answer ALL the questions in this section in the spaces provided.*

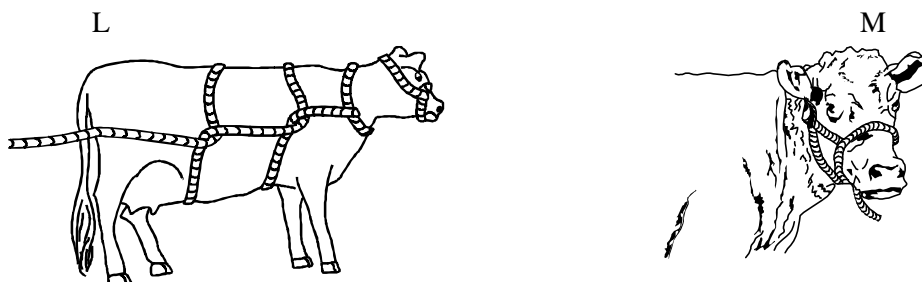
1. Name **four** structures used for handling dairy animals. (2 marks)
2. Give **four** advantages of tractor hire services. (2 marks)
3. a) State **two** predisposing factors of coccidiosis. (1 marks)
- b) Give **two** symptoms of brucellosis in cattle. (1 mark)
4. Give **four** functions of the funnel in egg formation. (2 marks)
5. State **four** factors determining the amount of feed taken by an animal. (2 marks)
6. List **four** maintenance practices to be carried on a cross-cut saw. (2 marks)
7. Give four reasons for raddling in sheep management (2 marks)
8. Name **four** livestock diseases that affect dairy cattle only. (2 marks)
9. Give **two** ways of adjusting depth of harrowing in a disc harrow. (2 marks)
10. State **four** components of water cooling system (2 marks)
11. Name **four** components of a water cooling system of a tractor engine. (2 marks)
12. State **four** reasons for debeaking. (2 marks)
13. Give **four** reasons for castration in livestock. (2 marks)
14. State **two** reasons for seasoning timber before using it for construction. (1 mark)
15. State **two** limitations of wind as a source of power. (1 mark)
16. State four qualities of thatch as a good roofing material. (2 marks)

**SECTION B : Answer ALL questions (20 marks)**

17. Below is an illustration of a farm structure. Study it carefully and answer the questions that follow.

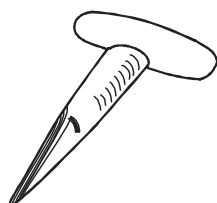
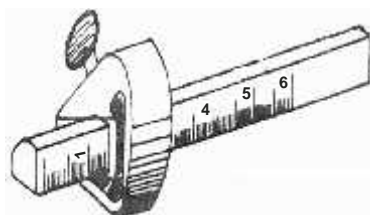
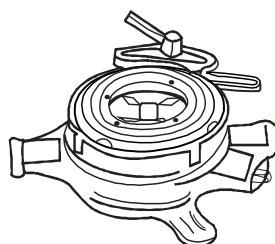
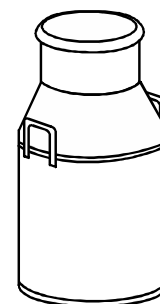


- a) Identify the above structure. (1 mark)
  - b) Name the parts labelled : (2 marks)
  - c) State four practices that should be carried out on the part labelled B, C and E to make them last longer. (2 marks)
18. The diagrams below show two methods of handling livestock in the farm. Use them to answer the questions that follow.



- a) Identify the methods of handling labelled L and M
- b) Give two occasions when it may be necessary to carry out the practice labelled L above. (1 mark)
- c) Give two animal conditions under which the method L above cannot be used. (1 mark)

19. The diagrams below illustrate farm tools and equipment. Study them and answer the questions that follow.

N<sub>1</sub>N<sub>2</sub>N<sub>3</sub>N<sub>4</sub>

- Identify the tools and equipment labelled above.
- Classify the above shown tools and equipment under:
  - Garden tools and equipment. (½ mark)
  - Workshop tools and equipment. (½ mark)
  - Plumbing tools and equipment. (½ mark)
  - Livestock production tool and equipment. (½ mark)
- State one function of each tool or equipment labelled N<sub>1</sub> and N<sub>3</sub>

20. The following is an illustration of an ox-plough. Use it to answer the questions that follow.



- Name the parts labelled F, G, K and I. (2 marks)
- State one function of the part labelled: (2 marks)
- List four situations in which the above implement would be more useful than a tractor. (2 marks)

### **SECTION C: (40 marks)**

**Answer any TWO questions.**

- Outline the procedure of training a calf for bucket feeding. (5 marks)
  - Highlight the advantages of artificial incubation. (5 marks)
  - Explain various practices used to prevent livestock diseases. (10 marks)
- Describe the factors that influence the choice of building materials. (10 marks)
  - Explain the pre-requisites for clean milk production. (10 marks)
- Discuss East coast Fever under the following sub-headings.
    - Causal organism (1 mark)
    - Symptoms of attack. (4 marks)
    - Control measures. (2 marks)
  - Describe the steps to be taken in maintaining hygiene in a deep litter poultry house. (5 marks)
  - Describe the signs of infestation by tape worm on an animal. (8 marks)

**NYAKACH SUB-COUNTY JOINT EVALUATION TEST***Kenya Certificate of Secondary Education***AGRICULTURE****Paper - 313/1****MARKING SCHEME****SECTION A (30 MARKS)**

1. **Four branches of agriculture that deals with livestock production.**
  - Pastoralism.
  - Bee keeping/apiculture.
  - Poultry keeping.
  - Fish farming/aquaculture. (4 x ½ = 2mks)
2. **Plant part used for propagating the following crops.**
  - Pyrethrum - splits.
  - Sweet potato - vines.
  - Sisal - bulbils/suckers.
  - Pineapple - crown/slip/suckers. (4 x ½ = 2mks)
3. **Two factors that may accelerate wind erosion.**
  - Speed of wind.
  - Types of soil.
  - Vegetation cover. (2 x ½ = 1mk)
4. **Two aspects of light that influence crop production.**
  - Light intensity.
  - Light duration.
  - Light wavelength. (2 x ½ = 1mk)
5. **Three types of records that are kept by both crop and livestock farmers.**
  - Production records.
  - Inventory records.
  - Marketing records.
  - Labour records. (3 x ½ = 1½mk)
6. **Four structural measures used in soil and water conservation.**
  - Trash lines/stones line.
  - Bunds.
  - Cutoff drains/diversion ditches.
  - Terraces.
  - Gabions/porous dams.
  - Dams/reservoirs. (4 x ½ = 2mks)
7.
  - Straight fertilizer.
  - Fertilizer that contains only one of the primary macro nutrients.
  - Side dressing.
  - Placement of nitrogenous fertilizer at the side of the crop being top dressed. (1 x 2 = 2mks)
8. **Two chemicals that are used during softening of water.**
  - Soda ash/sodium bicarbonate.
  - Alum/Aluminium sulphate. (½ x 3 = 1½mks)
9. **Two tertiary operations carried out during land preparation.**
  - Ridging.
  - Rolling.
  - Levelling. (2 x ½ = 1mk)
10. **Plant population** =  $\frac{\text{Area of land}}{\text{Spacing of crops}}$ 
  - Area of land = (2500 x 4000)cm
  - Spacing of beans = (20 x 15) cm
  - = 300cm (1 mark)
  - Plant population =  $\frac{10,000,000}{300}$
  - = 33,333 plants (1 mark)

11. Four reasons for land redistribution in Kenya.
- Eases population pressure.
  - Forms tsetse fly consolidated barriers.
  - Creates employment.
  - Increases population pressure (4 x ½ = 2mks)
12. Two types of inventory records in the farm.
- Consumable goods inventory.
  - Permanent goods inventory. (2 x ½ = 1mk)
13. Three forms of Agroforestry.
- Silvopastoral
  - Agrosilvopastoral.
  - Agrosilviculture. (3 x ½ = 1½mks)
14. Four reasons for keeping financial records.
- Secure loans.
  - Make sound management decisions.
  - Used in preparing farm budgets.
  - Used in evaluation of assets and liabilities.
  - Determines tax to be charged. (4 x ½ = 2mks)
15. Two narrow leaved weeds.
- i) Couch grass.
  - ii) Wandering jew. (2 x ½ = 1mk)
- Two poisonous weeds**
- i) Thorn apple
  - ii) Sodom apple (2 x ½ = 1mk)
- Two annual weeds**
- i) Pig weed
  - ii) Mexican marigold
  - iii) Thorn apple (2 x ½ = 1mk)
16. Four types of product -product relationship in agricultural economics.
- Joint products.
  - Competitive products.
  - Supplementary products.
  - Complementary products. (4 x ½ = 2mks)
17. Four functions of Sisal Board of Kenya.
- Registers sisal farmers.
  - Promotes sisal production.
  - Licenses sisal factories and exports.
  - Regulates production, grading and marketing of sisal.
  - Inspectorate unit ensure high quality sisal is exported.
  - Rebales sisal before it is exported. (4 x ½ = 2mks)
18. Two methods that can be used to train crops in the field.
- Staking.
  - Propping.
  - Trellising.

#### SECTION B (20 MARKS)

- 19 a) Aphid (1 x 1 = 1mk)
- b) Type of mouth part of the pest identified in (i)above. (1 x 1 = 1mk)
- Piercing and sucking.
- c) Two viral diseases in crops that are transmitted by the above pest.
- Groundnut rosette virus.
  - Groundnut mosaic virus.
  - Tobacco mosaic virus. (1 x 2 = 2mks)
- 20 a) C - carrots
- D - Bulb onion (½ x 2 = 1mk)



- b) Two late maturing variety of the vegetable labelled A.
- Early drumhead.
  - Prize drumhead.
  - Surc head.
  - Perfection
  - Savoy cabbage. (2 x 1 = 2mks)
- c) One physiological disorder that may affect the vegetable labelled B.
- Blossom end rot.
  - Cat face.
  - Radial rings.
  - Concentric rings.
  - Blotched fruits. (1 x 1 = 1mk)
- d) Category of vegetable illustrated by letters A, B, and D.
- A - leafy
  - B - Fruit
  - C - Root
  - D - Bulb
- 21 a) - root pruning
- b) - Reduces root damage during transplanting.
- c) - piano wire
- panga (½ x 2 = 1mk)
- 22 a) Mechanical land preparation.
- b) Two implements apart from the one above that can be used during the method mentioned in (i) above.
- Mouldboard plough.
  - rotovator
  - chisel plough
- c) Two reasons for carrying out primary cultivation.
- aerates the soil.
  - improves water infiltration.
  - buries organic matter.
  - exposes pests and disease causing organisms.
- d) - manual/hard cultivation
- ox -cultivation

### **SECTION C (40 MARKS)**

- 23 a) *Negative effects of wind in crop production.*
- Results in soil erosion/loss of plant nutrients hence poor growth of crops/silting of water ponds.
  - Results in lodging of crops/distortion/shading of leaves, flowers, fruits/breaking of branches.
  - Spreading of diseases/weed seeds/pests.
  - Disperses rain bearing clouds resulting into lack of rainfall.
  - It encourages transpiration hence wilting.
  - Destroys farm structures e.g crop stores, flower green houses etc.
  - Transfers agro-chemicals such as herbicides to unwanted areas.
  - Accelerates the rate of evapo-transpiration.
  - It causes stress to crops and young livestock due to chilling caused by cold winds/frost. (1 x 8 = 8mks)
- b) *Effects of diseases in tomato production.*
- Diseases attack results into reduced yields/production/quantity of tomatoes.
  - Lowers the quality of tomatoes.
  - Increased cost of production due to expenses involved in controlling the diseases. (1 x 4 = 4mks)
  - Results into total crop failure.
- c) *Methods of applying fertilizers in a crop field.*
- Broadcasting Application.
  - Scattering by hand or spreader to provide uniform distribution of fertilizer over the entire surface of the ground.
  - The fertilizer is worked into the soil through digging.
  - Placement Application
  - Well decomposed manures, phosphatic and potassic fertilizers in small quantities are used along with seeds during

sowing.

- Side Dressing
- application of fertilizers at the row or around a plant after the crop has grown.
- Recommended for nitrogenous fertilizers.
- Foliar Spraying
- Method of applying fertilizers to the foliage usually in the form of a spray solution.
- Pellets of fertilizers are dissolved in water to form foliar feed (fertigation).

(Statement = 1mk)

(Explanation = 1mk)

24 a) **Advantages of Mechanical Method**

- It is relatively cheap especially when hand tools are used.
- Infiltration of water into the soil & aeration is enhanced as the later is opened up.
- Earthing up to encourage root growth in cover crops is possible during tillage operations.
- Crop residue is incorporated into the soil hence increasing the nutrient status of the soil.
- Pests are controlled by exposing them to predators and sun scorching. (1 x 3 = 3mks)

**Disadvantages of Mechanical method**

- Laborious and expensive in large farms.
- Exp soil to erosion by destroying soil.
- Encourages loss of water by evaporation.
- Causes root disturbances for the crops in the field.
- May cause conducive environment for weed growth. (1 x 3 = 3mks)

b) **Importance of Farm Budgeting.**

- Can be used to obtain farm credits/loans.
- Detects efficient or weak areas in farm operations.
- Periodic analysis of farm business is made possible.
- It assists the farmer in decision making. Impulse buying and over expenditure are avoided through proper budgeting.
- Results into timely, careful and adequate consideration of all factors involved in farm business before making management decisions.
- Enables the farmer to predict future returns. Planning can therefore be made in good time.
- Uncertainty existing in lower levels of management as per basic policies and objectives are eliminated.
- Estimation and determination of future taxes is made possible.
- Indicates whether there is progress or laxity towards the set objectives.
- Helps the farmer to avoid incurring losses by investing in less productive enterprises.
- Farmers are encouraged to give timely and adequate attention to the effect of the expected trend of general farming conditions.
- xii) Important when submitting tenders for farm tenancy. (1 x 6 = 6mks)

|  |                          |                                     |
|--|--------------------------|-------------------------------------|
| No. 0025                                 | LOCAL PURCHASE ORDER     |                                     |
| TO SONDU AGROVET<br>P.O BOX 233<br>SONDU | KABETE FARM<br>P.O OBOCH | Date 20 <sup>th</sup> February 2014 |
| Item No.                                 | Particulars              | Quantity                            |
| 1  | Growers mash             | 20 (50kgs) bags                     |
| 2  | C.A.N fertilizer         | 8(10kgs) bags                       |
| 3  | Bean Seeds (Mwezimoja)   | 30 (2kgs) packets                   |
| 4  | Dairy Meal               | 4 (90kgs) bags                      |
| 5  | Fungicide                | 20 litres                           |
| 6  | Salt lick                | 20 blocks                           |
| 7  | Rakes                    | 10 pieces                           |

- 25 a) Five factors influencing crop rotation programme to be adopted by a farmer.
- i) *Growth habits of the crop/crop root depth*
    - Deep rooted crops eg cassava should alternate with shallow rooted crops e.g maize.
  - ii) *Nutrient requirement of the crop*
    - Crops with high nutrient requirements e.g maize and cotton should be planted first on a virgin land.
  - iii) *Pest and Disease attack.*
    - Crops from the same family should not succeed each other as they are liable to the same pests and diseases e.g potatoes and tomatoes.
  - iv) *Availability of Capital and Market*
    - Consider either beans or peas for legumes; sweet potatoes or cassava for deep roots and maize or sorghum for cereals depending on the available capital and market for the produce.
  - v) *Weed Control.*
    - Crops which can easily be weeded e.g cotton should alternate with those which are not easy to weed e.g barley and wheat.
    - Crops which share the same weeds i.e crops affected by the same weeds such as maize and sorghum should not succeed each other.
  - vi) *Soil fertility.*
    - a resting period of 3 - 6 years should be included in the programme.
    - This ensures the rebuilding of the soil structure.
  - vii) *Soil Fertility.*
    - leguminous crops such as groundnuts that fix nitrogen should be included in the programme in order to improve soil fertility.
- b) Ten reasons for draining agricultural land.
- It facilitates leaching of harmful minerals e.g Sodium into the lower horizons.
  - Improves aeration of the soil.
  - Raises the soil temperature.
  - Increases activity of micro-organisms in the soil due to improved aeration.
  - Reduces the runoff water thus lowering the rate of soil erosion.
  - Improves soil P<sup>H</sup> hence availability of certain nutrients.
  - Stabilises water table.
  - Increases the soil volume i.e the root zone has a large area to explore thus improving nutrient uptake.
  - Eradicates intermediate hosts of some parasites affecting livestock.
  - Reduces incidences of livestock diseases such as foot rot. (1 x 10 = 10mks)

**NYAKACH SUB-COUNTY JOINT EVALUATION TEST***Kenya Certificate of Secondary Education***AGRICULTURE****Paper - 311/2****MARKING SCHEME**

- 
1. Structures for handling dairy animals
    - Crush
    - Milking parlour
    - Calf pens
    - Spray race/plunge dip (½ x 4 = 2mks)
  2. Advantages of tractor hire services.
    - Cheaper than buying a tractor.
    - No maintenance cost incurred by the farmer.
    - Work is done faster.
    - There is timely operation.
    - Cheaper than manual labour.
    - More efficient than manual labour. (½ x 4 = 2mks)
  - 3 a) Predisposing factors of coccidiosis.
    - wetness/dampness
    - overcrowding
    - dirty conditions. (½ x 2 = 1mk)
  - b) Symptoms of brucellosis in cattle.
    - Abortion in late gestation.
    - Retention of afterbirth after abortion.
    - Yellow, brown, shiny discharge from the vulva.
    - Cows exhibit temporary sterility/bulls have low libido. (½ x 2 = 1mk)
  4. Functions of funnel in egg formation.
    - Receives the ovum after release.
    - Stores sperm.
    - Is the site/seat of fertilization.
    - Forms chalazae on to the yolk. (½ x 4 = 2mks)
  5. Factors determining the amount of feed taken by an animal.
    - Body size/live weight of the animal.
    - Physiological condition of the animal wealth status of the animals.
    - Age of the animal.
    - Level of production/purpose of the animal.
    - Amount of feed already taken by the animal. (½ x 4 = 2mks)
  6. Maintenance practices to be carried on a cross-cut saw.
    - Clean after use.
    - Oil the blade to prevent rusting.
    - File the teeth/sharpen the teeth.
    - Set the teeth.
    - Store properly.
    - Repair/replace broken handle.
    - Straighten the blade when bent.
    - Tighten loose nuts and bolts. (½ x 4 = 2mks)
  7. Reasons for radding in sheep management.
    - To identify the size of the lambs.
    - To identify the barren ewes.
    - To identify the infertile rams.
    - To identify the most fertile rams. (½ x 4 = 2mks)
  8. Livestock diseases that affect dairy cattle only.
    - Milk fever.
    - Mastitis.
    - Virginitis
    - Vibriosis (½ x 4 = 2mks)
  9. Ways of adjusting depth of harrowing in a disc harrow.
    - Altering the angle of discs to the direction of travel.

- Adding weights on the frame work.
- Adjusting the height of the wheels. (1 x 2 = 2mks)
- 10. Four practices carried out on the calf soon after birth.
  - Wipe the calf dry.
  - Help the calf to breath.
  - Cut and disinfect the navel cord.
  - Ensure the calf suckles well.
  - Weigh the calf. (½ x 4 = 2 mks)
- 11. Components of a water cooling system.
  - Radiator.
  - The water pump.
  - The fan.
  - Thermostat.
  - The temperature gauge. (½ x 4 = 2mks)
- 12. Reasons for debeaking.
  - To control cannibalism in birds.
  - To minimize egg eating.
  - To control toe pecking.
  - To control feather plucking. (½ x 4 = 2mks)
- 13. Reasons for castration in livestock.
  - To control breeding diseases.
  - To control breeding.
  - To control inbreeding.
  - To fasten growth rate.
  - To increase quality of meat by removing bad smelties in goats.
  - To improve meat quality/for even distribution of fats.
  - To make them docile. (½ x 4 = 2mks)
- 14. Reasons for seasoning timber before using it for construction.
  - To prevent warping.
  - To prevent rotting due to fungal/attack.
  - To prevent insect damage. (½ x 2 = 1mk)
- 15. Limitations of wind as a source of power.
  - Expensive to harvest.
  - Is unreliable in availability and speed.
  - Its direction is unpredictable. (½ x 2 = 1mk)
- 16. Qualities of thatch as a good roofing materials.
  - Sound proof.
  - Has good thermo-regulatory ability.
  - Is locally available.
  - Is affordable. (½ x 4 = 2mks)

### **SECTION B (30MKS)**

- 17 a) Barbed wire fence (1 x 1 =1mk)
- b) Parts labelled
- A - Diagonal strut/support. (½ x 1 = ½mk)
  - B - Corner post/king post (½ x 1 = ½mk)
  - C - End post (½ x 1 = ½mk)
  - D - Dropper (½ x 1 = ½mk)
  - E - standard/ordinary post
- c) Practices carried out on parts B, C and D to make them last longer.
- Reinforce with concrete.
  - Cutting the top of the posts at a slope.
  - Covering the top of the posts with a plate.
  - Carrying/slight burning of the posts.
  - Applying wood preservatives e.g dieldrin, creosote, tar, sodium dichromate pentachlorophenol, etc.
  - Painting.
  - Seasoning/proper drying. (½ x 4 = 2mks)
- 18 a) L - casting (½mk)

- M - use of halter (½mk)
- b) Occasions when method L is used.
- During examinations.
  - During treatment of livestock e.g injection or vaccination.
  - During castration.
  - When dehorning/disbudding the animal.
  - When branding/identification marks.
  - When hoof trimming.
- c) i) When the animal is in calf/pregnant.  
 ii) When the animal is fully fed/satisfied. (½ x 2 = 1mk)
- 19 a) N<sub>1</sub> \_\_\_\_\_ Dibber (½mk)  
 N<sub>2</sub> \_\_\_\_\_ marking gauge (½mk)  
 N<sub>3</sub> \_\_\_\_\_ stock and die (½mk)  
 N<sub>4</sub> \_\_\_\_\_ milk churn/can (½mk)
- b) i) N<sub>1</sub> \_\_\_\_\_ dibber  
 ii) N<sub>2</sub> \_\_\_\_\_ marking gauge  
 iii) N<sub>3</sub> \_\_\_\_\_ stock and die  
 iv) N<sub>4</sub> \_\_\_\_\_ milk churn/can
- c) N<sub>1</sub> (dibber) \_\_\_\_\_ for digging holes for transplanting. (½mk)  
 N<sub>3</sub> -(stock and die) - for cutting threads on water pipes. (½mk)
- 20 a) F - mouldboard (½mk)  
 G - Share (½mk)  
 K - u-bolt (½mk)  
 I - draft rod (½mk)
- b) i) F - to invert the furrow slice (½mk)  
 ii) G - to cut the furrow slice horizontally (½mk)
- c) i) Sloppy areas.  
 ii) Small piece of land.  
 iii) Where the land is stony/with obstacles  
 iv) Lack of capital to buy/purchase tractor. (½ x 4 = 2mks)

### SECTION C

- 21 a) *Procedure of training a calf for bucket feeding.*
- Put milk in a clean bucket.
  - Push calf backwards to the corner of the calf pen.
  - Wash your hand using clean water mixed disinfectant.
  - Holding the bucket with the left hand dip the index finger of the right hand into the milk and slowly guide the calf to suck it.
  - Ensure the calves head is slightly raised during the first few minutes.
  - Encourage the calf to drink slowly from the bucket. (1 x 5 = 5mks)
- b) *Advantages of artificial incubation*
- Low risk of parasite and disease attack.
  - Many chicks can be hatched at once.
  - A farmer can plan when to hatch chicks.
  - Egg production is not affected by incubation.
  - Incubators can be used continuously. (1 x 5 = 5mks)
- c) *Various practices used to prevent livestock diseases.*
- Isolation of sick animals- this is done to prevent the spread of diseases to the healthy animals.
  - Proper feeding - this is to protect animals from deficiency diseases.
  - Vaccination - this is done to develop resistance/immunity to diseases in livestock.
  - Prophylactic treatment - animals are given drugs on routine basis to protect them from contracting certain disease.
  - Control of vectors - this is done to prevent the spread of diseases from sick ones to the healthy ones.
  - Slaughtering of the infected animals - this is done to prevent the spread of highly contagious diseases.
  - Treatment of sick animals in order to restore good healthy and stop further spread of diseases.
  - Quarantine - this is done to prevent the spread of diseases to healthy ones. (2 x 5 = 10mks)
- 22 a) Factors influencing the choice of building materials.
- Costs of the materials to be used.
  - Availability of the materials required.
  - Availability of required skills/labour.
  - Availability of capital to buy the materials.

- Environmental conditions/climatic of the area.
  - Strength of the material in respect to the use.
  - Durability of the material.
  - Suitability of the material to the work to be done.
  - Workability of the material/applicability of the material.
  - Toxicity of the material.
  - Farmer's taste and preference.
  - Type of building e.g whether temporary or permanent. (1 x 10 = 10mks)
- b) Pre-requisite for clean milk production.
- Healthy cows:- ensure that the lactating cows are healthy and free from mastitis.
  - Healthy milk man - the milkman should be free from contagious diseases to avoid contamination of milk.
  - Clean cows - clean the cows' udders/teats with warm water/trim long hair on the flanks to avoid contamination of milk.
  - Clean milking shed/parlour - milking shed should be clean to avoid smells that may taint milk.
  - Clean milking utensils - the utensils should be easy to clean and disinfected and free from seams.
  - Straining milk - use milk strainer or a white piece of cloth to remove any dirt's from milk.
  - Cooling milk - milk should be stored under cool temperatures below 5°c to reduce rate of multiplication of micro-organisms.
  - Avoid milk tainting - do not expose milk to the sun's rays not feed the cow on feed stuffs that cause tainting before milking. (2 x 5 = 10mks)
- 23 a)
- i) Causal organism  
Theirelia parva (1 x 1 = 1mk)
- ii) Symptoms of attack
- Swollen lymphatic nodes.
  - High body temperature/high fever.
  - Profuse salivation.
  - High lachrimation/animal produces a lot of tears.
  - Difficult/laboured breathing.
  - Coughing.
  - Sight impairment/corneal opacity.
  - Haemorrhages in the vulva and mouth.
  - Loss of appetite/anorexia.
  - Animal isolates itself. (1 x 4 = 4mks)
- iii)
- Control ticks by regular spraying dipping or hand dressing.
  - Fence off the farm to keep out strange animals and confine animals within.
  - Treat animals using appropriate drugs. (1 x 2 = 2mks)
- b) Steps taken to maintain hygiene in a deep litter poultry house.
- Regularly wash and disinfect feeders/waterers/perches.
  - Replace old/wet litter/turn litter regularly.
  - Control rodents/vermin's.
  - Use footbath for visitors before entering the house.
  - Avoid water pouring into the litter/avoid dampness in the poultry house.
  - Isolate sic birds.
  - Treat sick birds.
  - Dispose of dead birds immediately. (5 x 1 = 5mks)
- c) Sign of infestation by tapeworm on an animal.
- Weak and emaciated animal.
  - Lack of appetite/anorezia in primary host.
  - Starry coat.
  - Anaemic condition.
  - Swelling on the underside of the jaw.
  - Segments of the parasite seen in faeces of the primary host.
  - Blockage of intestinal tract in primary host.
  - Constipation/scouring.
  - Pot bellied in young ones.
  - Cystic swellings under the tongue.
  - Excessive appetite in the secondary host. (1 x 8 = 8mks)

**KIMA JOINT EVALUATION TEST 2015****AGRICULTURE**

Paper 1

July/August 2015

**MARKING SCHEME****SECTION A :**

1. Four sites of agroforestry trees
  - boundaries
  - river banks
  - terraces
  - between pastures / between crop rows
  - homestead

**4 x ½ = 2mks**
2. Farming practices that reduce effects of water stress in crop production
  - mulching
  - early planting
  - planting early maturing crops
  - land fallowing
  - contour cropping / contour farming
  - minimum tillage

**4 x ½ = 2mks**
3. Two conditions when opportunity cost is zero
  - when there are no alternatives / choices of enterprises
  - when production resources are unlimited / free goods / abundant in supply

**½ x 2 = 1mk**
4. Methods of breaking seed dormancy
  1. Calliandra - Heat treatment / light burning
  2. Rice - soaking in water / pregermination

**2 x ½ = 1mk**
5. Undersowing - establishment of a pasture under an already growing crop  
Oversowing - introduction of a legume pasture in an already established grass pasture  
*mark as a whole*

**2 x 1 = 2mks**
6. Advantages of mixed grass legume pasture
  - More palatable than pure grass
  - Security against total loss
  - Higher yields per unit area of land
  - More nutritious
  - Maximum use of soil nutrients
  - Better weed control effect
  - Reduce soil erosion due to good ground cover
  - Improve soil fertility due to nitrogen fixation by legume
  - Economy in the use of fertilizers
  - Better seasonal distribution of growth / early and late maturity species

**4 x ½ = 2mks**
7. Factors determining size of pit for silage making
  - Number of animals to be fed
  - Length of dry season the materials are to cater for
  - Amount of plant materials available for ensiling
  - Bulkness of material

**2 x ½ = 1mk**
8. Sources of nitrogen in the soil
  - Microbial / fixation of soil micro-organisms
  - Fixation by lightening
  - Application of inorganic fertilizers

**3 x ½ = 1½mks**
9. a) Hardening off - prepare the seedlings to adapt to ecological conditions in the field / seedbed ½ x 1 = ½  
b) Hardening in onions - to harden the skin to avoid bruising during harvesting and transportation ½ x 1 = ½mk  
i) Forking - avoid addition of organic manure to the soil ½ x 1 = ½  
Greening - earthing up the shoulders of carrots ½ x 1 = ½
10. Ways of land acquisition in Kenya
  - Leasing
  - Inheritance
  - Government settlement / resettlement



– Purchasing  $3 \times \frac{1}{2} = 1\frac{1}{2}mks$

**11. Choosing farm enterprise**

- Availability of capital
- Size of land
- Skills required / level of technology
- Disease and pest prevalence
- Climatic conditions
- Government policy  $4 \times \frac{1}{2} = 2mks$

**12. Ways of raising soil PH**

- Liming / application of lime
- Application of basic / alkaline fertilizer
- Additional of manures  $2 \times \frac{1}{2} = 1mk$

**13. a) Effects of early defoliation**

- High moisture content
- High protein content on weight basis
- Very low DM / low dry matter yield
- High dry matter digestibility but low digestible nutrients
- Weakening of stand / reduced productivity of stand  $2 \times \frac{1}{2} = 1mk$

b) If the output is constant it is profitable to substitute one input factor with another so as long as the one substituted is cheaper than the other  $1 \times 1 = 1mk$

**14. Effects of pests**

- Suck plants sap causing wilting / stunted growth
- Some inject toxic saliva / secretions leading to distorted growth / death of plants
- Lower quality of crop products
- Transmit / introduce disease agents
- Inflect wound / opening which provide entry for secondary infections
- Lower crop yields  $3 \times \frac{1}{2} = 1\frac{1}{2}mks$

**15. a) Combination of both cultural and chemical methods to control crop pests  $1 \times 1 = 1mk$**

b) Damage beyond tolerance by pests hence a control measure must be effected  $1 \times 1 = 1mk$

**16. Disadvantage of vegetative propagation**

- No new crop varieties formed
- Difficult to keep materials free of diseases
- Materials cannot be stored for long
- Bulky / difficult / expensive to store or transport  $4 \times \frac{1}{2} = 2mks$

**17.**

- Swampy / water logged / marshy poorly drained
- Rocky / stony ground
- Steep areas
- Eroded / denudated bare land
- Tsetsefly infested areas
- Bushy areas  $4 \times \frac{1}{2} = 2mks$

**18. Four morphological conditions**

- Location of growing points
- Leaf angle
- Nature of leaf surface
- Presence of underground structures
- Leaf surface area  $4 \times \frac{1}{2} = 2mks$

**SECTION B :**

**19. a) Armyworms  $\frac{1}{2}mk$**

b) Biting and chewing mouthparts  $\frac{1}{2}mk$

c) i) Spray with appropriate pesticide

ii) Early planting  $2 \times 1 = 2mks$

d) Move in large numbers and cause total leaf destruction  $1 \times 1 = 1mk$

**20. a) Blossom end rot  $1 \times 1 = 1mk$**

b) i) Excess nitrogen in early stages of growth

- ii) Deficiency of calcium in young fruits  
 iii) Irregular / infrequent watering  $2 \times 1 = 2mks$
- c) i) Regular watering (rej. watering)  
 ii) Addition calcium fertilizers e.g. CAN  
 iii) Avoid excessive application of nitrogenous fertilizers  $2 \times 1 = 2mks$
21. a) A - thorn apple (Datura Stramonium)  
 B - Devils horsewhip (Achranthes aspera)  $2 \times 1 = 2mks$
- b) A - poisonous to livestock  
 B - irritating to livestock / farmer  $2 \times 1 = 2mks$
22. a) C1 - root stock  $1 \times 1 = 1mk$   
 C2 - scion  $1 \times 1 = 1mk$
- b) C3 - grafting / whip grafting / tongue grafting  $1 \times 1 = 1mk$   
 D - ground layering / layering / trench layering / compound layering  $1 \times 1 = 1mk$

## 23. Cotton

Yield = 2500 x 10 = Ksh.25000

Labour = 100 x 25 = Ksh.2500

Seeds = 100 = Ksh.100

TSP = 2000 = Ksh.2000

SA = 1500 = Ksh.1500

Sprays = 500 = Ksh.500

Total variable costs 6600 ü½

Gross margin/ha = 25000 - 6600 = 18400ü½

Groundnuts

Yield = 2000 x 12 = Ksh.24,000

Labour costs 30 x 25 = Ksh.1250

Seeds = Ksh.1000

SSP = 1500

Sprays = 200

Total variable costs Ksh.3950 ü½

Gross margin/ha = Ksh.24,000 - 3950 = Ksh.20,050 ü½

b) Groundnuts ½mk

c) Because has higher gross margin 1mk

**SECTION C**24. Production of Bulrush millet

a) Ecological requirements

- altitude 0 - 1200m a.s.l
- rainfall of 500mm-600mm p.a
- soils well drained rich in nutrients or moderate fertile

**4 x 1 = 4mks**b) Field preparation and planting

- cultivate early
- plant before onset of rains
- disc / mouldboard ploughing
- disc harrowing to break clods
- rotorvating to set finer tilth
- spring tine harrowing to get trash and create small drills
- broadcasting followed by shallow cultivation / seed drilling to a depth of 4cm in the drills mixed with phosphatic fertilizers spacing 60cm x 15cm at onset of rains
- seed covering lightly using a rake of fine harrows

**6 x 1 = 6mks**c) Harvesting and storage

- hand cutting the head when dry by use of sharp knives, sickles etc.
- drying and threshing the head to get grain
- winnowing
- dry to moisture content of 14%
- dust with chemical insecticide to prevent damage in store
- store in gunny bags, silos, bins etc.

**5 x 1 = 5mks**

d)

- expensive
- poisonous to man and livestock
- have a high residual effect
- requires skills to apply
- pollutes the environment

**5 x 1 = 5mks**

25. a)

- poor soil / infertile soils with little nutrients

- poor weed control leading to competition for nutrients, light and moisture
- low rainfall / too much rainfall / unreliable rainfall
- pest and disease attack on crops
- extreme soil PH / too acid or too basic soil
- damage by hailstones / causing defoliation
- inappropriate soil dept that limit root penetration
- extreme temperatures either too high or too low
- extreme light intensity / too high / too low
- presence of mist and fog reduces photosynthesis to crops
- excessive wind that destroy and increase transpiration rates

**10 x 1 = 10mks****b)**

- plant at same depth
- plant seeds at same time
- plant seed at uniform soil moisture content
- practice / prepare field to uniform level
- select seeds of same size / type and variety
- treat seeds against soil borne pests and diseases
- irrigate seeds uniformly
- break seed dormancy
- select seeds of same age / dormancy period
- plant seeds which are disease and pest free **10 x 1 = 10mks**

**26. a)**

- Establish ownership of land within specific area
- Land is surveyed / measured
- Detailed maps showing existing boundaries of the land are drawn by surveyors
- Land is recorded against the individual owner
- Maps and records of the land are submitted to the district land registry
- The land is then registered
- Title deed / land certificate is issued **6 x 1 = 6mks**

**b)**

- Training the labour force
- Labour supervision
- Farm mechanisation / use of efficient tools and equipments
- Giving incentives / promotion / rewards / proper housing etc.
- Better pay / prompt pay
- Assign duties according to ability / interest / skill

**4 x 1 = 4mks****c)**

- marketing farmer's produce
- negotiating a fair prices for farmers produce
- provision of credit facilities / get loans on easy terms
- train and educate farmers on better techniques of production
- keeping correct records
- paying out dividends to members
- processing agricultural raw materials

**5 x 1 = 5mks****d)**

- Population - the higher the population the higher the demand
- Income of consumers - demand increases with increase in income of consumers / buyers
- Preference / taste - buyers will have high demand for what is liked that its substitute
- Price of related goods / substitute - demand of tomatoes increases with an increase in the price of its substitute
- Advertisement - it creates awareness increasing sale / demand
- Beliefs, customs and taboos - may forbid consumption of tomatoes decreasing demand
- Price expectation - if price of tomatoes is expected to go up in future its demand go up presently
- Level of taxation - the higher the level of taxation the higher the price resulting to low demand
- Perishability - loss of freshness lowers demand
- Future uncertainty - future shortage is expected there will be increase in demand

**mark as a whole the 1st five well 5 x 1 = 5mks**

**KIMA JOINT EVALUATION TEST 2015****AGRICULTURE****Paper 2****July/August 2015****MARKING SCHEME**

1. Dry cow therapy
  - The process of controlling mastitis by infusing antibiotics (penicillin) through teat canal when a cow is dried off  
*1 x 1 = 1 mk*
2. A tool used for tightening barbed wire
  - wire strainer / monkey strainer  
*1 x 1 = 1mk*
3. Four maintenance practices requirements of jackplane
  - cleaning the jack plane after use
  - tightening screws and nuts
  - oiling / lubricating
  - adjusting screws
  - sharpening the blade
  - replacing the broken parts  
*1/2 x 4 = 2mks*
4. Three precautions taken when seasoning timber by air for construction
  - provide roofed shed to keep direct sunshine or rain
  - stack timber in heaps supported of the ground to allow the free air circulation
  - separate the timber using wooden rods (sticks) to allow passage of air
  - keep the support and sticks closely to avoid sliding and bending  
*1/2 x 3 = 1 1/2mks*
5. Two desirable qualities of a livestock ration
  - it should be balanced in terms of nutrients
  - it should be palatable to the animal
  - highly digestible
  - free from contaminants
  - free from poisonous substances  
*1/2 x 2 = 1mk*
6. Two methods used by farmers to prevent piglet anaemia
  - giving iron injection
  - give iron paste
  - giving spinach
  - giving red sub-soil  
*1/2 x 4 = 2mks*
7. Four causes of stress in a flock of layers
  - overcrowding
  - pest infestation / disease outbreak
  - noise / predators / handling / strangers e.g. mongooses
  - sudden change of routine e.g. in feeds, environmental change
  - unbalanced diet
  - extreme temperatures
  - introducing new birds in the flock
  - lack of feed and water  
*1/2 x 4 = 2mks*
8. Two disadvantages of inbreeding
  - increase embryonic mortality / abortion
  - reduced disease resistance
  - reduces vigour of the animal / makes it weak / cause abnormalities
  - reduces yield  
*1/2 x 2 = 1mk*
9. Four non-chemical methods of controlling ticks in cattle
  - burning infested pasture
  - hand picking and killing ticks
  - double fencing of pasture land
  - zero grazing / restrict movement of animals / fencing
  - ploughing infested pasture  
*1/2 x 4 = 2mks*
10. Examples of one host tick
  - the blue tick (*Boophilus decoloratus*)
  - the cattle tick (*Boophilus microplus*)

- the Texas fever tick ( *Boophilus annucalatus*)
  - the Tropical horse tick (*Dermacentor nitens*)  $\frac{1}{2} \times 3 = 1\frac{1}{2}mks$
- 11. Disadvantages of natural mating**
- it is uneconomical to keep a bull
  - may lead to uncontrolled mating
  - high risk of transmission of breeding diseases
  - only a small number of cows can be served
  - aggressive and heavy bulls may cause physical injury to a cow or to the handler  $\frac{1}{2} \times 4 = 2mks$
- 12. Qualities of clean milk**
- free from disease causing organisms
  - free from dirt / foreign materials
  - normal smell and flavour
  - chemical composition within the expected range  $\frac{1}{2} \times 4 = 2mks$
- 13. Types of lubricating systems**
- splash feed type
  - force feed type
  - oil mist type  $\frac{1}{2} \times 3 = 1\frac{1}{2}mks$
- 14. Maintenance practices carried out on trailers**
- Check tyre pressure and adjust accordingly
  - Grease moving parts to minimize friction
  - Tighten any loose nuts and bolts
  - Replace or repair broken parts
  - Check the condition of the harness and repair it if necessary
  - Clean the implement after use
  - Keep the implement under a shade  $\frac{1}{2} \times 4 = 2mks$
- 15. Reasons for dehorning cattle**
- To prevent injuries to the farmer and other animals
  - To make the animals easy to handle
  - For economical use of space when transporting and feeding as polled animals take less space
  - To avoid destruction of farm structures
  - To make animals look beautiful  $\frac{1}{2} \times 4 = 2mks$
- 16. a) Reasons why too much air in the silo is undesirable in the process of making silage**
- Too much air may cause overheating
  - Too much air may cause decomposition  $\frac{1}{2} \times 2 = 1mk$
- b) Types of silos for making silage**
- trench silo
  - clamp silo
  - bunker silo
  - polythene bags  $\frac{1}{2} \times 3 = 1\frac{1}{2}mks$
- 17. Signs of milk fever**
- paralysis / inability to move or rise
  - muscular twitching / shivering
  - stiffening of the whole body
  - head turned back
  - unconsciousness
  - walking in a staggering manner  $\frac{1}{2} \times 4 = 2mks$
- 18. Observable features that distinguish dromedary camel from Bactrian camel**
- the dromedary has one hump while Bactrian camel has two
  - Bactrian is found in cold areas while dromedary thrive in hot areas
  - Dromedary camel is bigger in size than Bactrian
  - the dromedary has less hair / fur on its body while the Bactrian has more hair / fur
  - Dromedary has long legs while the Bactrian has short compact legs  $3 \times 1 = 3mks$
- NB: The difference has to be clearly brought out**
- 19. Importance of feed additives**
- stimulate faster growth

- protect animal against diseases
- keep animals calm during transit  $\frac{1}{2} \times 2 = 1mk$

**SECTION B**

**20.a)** Artificial incubator  $1 \times 1 = 1mk$

**b)A** - Thermometer

B - water bath / warm water

C - damp cloth

$\frac{1}{2} \times 3 = 1\frac{1}{2}mks$

**c)** A - to check temperature in the incubator

B - distribute the heat from heat source evenly / maintain relative humidity

C - maintain relative humidity  $\frac{1}{2} \times 3 = 1\frac{1}{2}mks$

**d)** ensure even distribution of warmth for even chick development

- to avoid the germinal disc from sticking to the egg shell and hence reducing hatchability  $1 \times 1 = 1mk$

**21.a)** D - Rafter

E - Cross tie

F - Purline

G - Gutter  $\frac{1}{2} \times 4 = 2mks$

**b)** To support roofing materials

- to ensure that the roofing materials held after nailing on to the iron sheets  $\frac{1}{2} \times 2 = 1mk$

**c)** G - gutter to collect water to be stored in water tanks

- to prevent rain water from splashing  $1 \times 2 = 2mks$

**22. a)** Methane gas  $1 \times 1 = 1mk$

**b)** Slurry - it is used for manuring crops on the farm  $1 \times 1 = 1mk$

**c)** Animal wastes e.g. cowdung, poultry droppings and pig waste

**d)**

- it is used for cooking and heating

- in some countries, biogas is used in internal combustion engines

- used for lighting

- used to run refrigerators

**23.a)** M - log hive

N - Kenya Top Bar hive

P - smoker

Q - Veil

**b)** P - puffing smoke into the hive

Q - protects the head / face from bee stings to enable handler see through without fear of bee stings

**c)**

- Produces high quality honey

- Honey combs can be removed without disturbing the brood

- Cheap / easy to construct and repair

- Has bars that can be lifted in order to inspect the comb

**d)** 1. Hanging wire - suspending the hive

2. Entrance / exit- for movement of bees in and out of the hive

- Ventilation

**SECTION C**

**24. a)**

- Clear vegetation

- Level site

- measure the dimensions of the structure

- fix / mark with pegs the measured ground

- dig the trench as per the recommendations / measurements

- fill the trench with concrete of strength 1 : 2 : 4 / 1 : 3 : 6

- place steel rods in the trench to reinforce concrete

- compact the concrete

- lay the foundation stone upto about 15cm above the ground

- join the foundation stones with mortar of strength 1 : 6 (cement : sand)

- Place damp proof course of PVC on the top of the foundation to reduce moisture rising up and termite attack

- fill the floor with stones / soil (hardcore)

- Firm the hard core by ramming

- make a concrete slab 1 : 2 : 4

**1 x 13 = 13mks****b)**

- Direction of prevailing wind - to avoid foul smells drifting to the homestead
- Centrally placed - prevent animal from walking for long distances
- Reliable source of water - to facilitate filling of the dip tank
- Drainage - well drained soil to prevent damage of structure by water / dampness
- Topography - gentle sloping to keep off run-offs from the dip wash
- Accessibility - easily accessible by animals from all parts of the farm
- Located safe distance from natural water sources / pasture - to avoid pollution / contamination

**25.a)**

- Clutch
- Gear box
- Differential
- Final drive

**4 x 1 = 4mks**Clutch**b)**

- Connects or disconnects the drive shaft to or from the engine
- Facilitates smooth and gradual take off
- Provides power from the engine to the PTO (power take off)

**2 x 1 = 2mks**Gearbox

- selecting forward or reverse gear to suit the speed
- adjust speed of drive from crankshaft to drive shaft
- transmit power from the engine
- enables tractor to stop even when the engine is running

**2 x 1 = 2mks**Differential

- change the direction of drive to right angles to enable power to be transmitted to the wheels for forward movement
- moderates / adjusts the motion speed as opposed to engine speed
- enable each of the rear wheels to rotate independently which help when turning corners

**2 x 1 = 2mks**Final drive

- Includes wheels and tyres
- Moves the tractor forward or backward
- Enables soft contact with the ground
- Inflated wheels / tyres provide absorption of shock and traction

**2 x 1 = 2mks**c) Operational differences between disc and mouldboard ploughDisc plough

- i) Can be used in field with obstacles and hard soils
- ii) Ploughs / cuts at varying depth
- iii) Require less power to pull
- iv) Poor furrow slice inversion
- v) More harrowing are required
- vi) Not easily broken by obstacles
- vii) Doesn't require constant replacement of parts

Mouldboard plough

- cannot be used in fields with obstacles / hard soils
- cuts / plough at uniform depth
- require more power to pull
- proper furrow slice inversion
- fewer harrowing required
- easily broken by obstacles
- require constant replacement of parts e.g. share
- does not work well in sticky soils
- require more skill to operate

**8 x 1 = 8mks****NB: mark as a whole****26. a) - oxytocin**

- adrenaline **2 x 1 = 2mks**

**b)**

- assemble milking equipment
- bring animal to milking shed / parlour
- restrain the animal
- wash udder with warm water and udder cloth
- dry the udder with udder cloth / towel
- test for mastitis using strip cup / milk the 1st few drops of milk into the strip cup
- apply correct milking technique to milk

- strip the teats after milking / teat stripping
- infuse antimastitic drugs into the teat canal / dip the teats in antibiotic solution / anti-mastitic solution
- release the animal
- weigh and record milk yield
- sieve and cool the milk to 4°C and store / transport in milking churns
- wash milking parlour / shed and the milking equipments **8 x 1 = 8mks**

**c) Rearing of day of chicks in a brooder**

- ensure brooder corners are rounded
- provide enough brooding space
- clean and disinfect brooder
- provide litter on the floor
- feed the chicks with chick mash / broiler starter mash
- maintain appropriate range of temps according to the age of chicks i.e. starting 35°C first week to 26°C at end of brooding
- maintain proper ventilation
- provide appropriate lightning / dim light to avoid the pecking / cannibalism
- provide adequate and appropriate feeders and waterers
- provide clean plenty water
- control parasites by applying appropriate pesticides
- vaccinate against diseases / mareck's, gumboro, newcastle etc.
- isolate / treat sick chicks immediately
- debeak 8-10 days towards end of brooding
- spread sheet of paper on top of litter and scatter feeds on the floor for the first few days
- remove and dispose dead chicks
- gradually change chick mash to growers mash in the 8th week
- provide wire mesh around the source of heat to guard the chicks
- repair and replace worn out / broken parts of the brooder
- administer prophylactic drugs / coccidiostats to control coccidiosis
- raking / turning the litter to avoid dampness
- keeping good and accurate records on all operations **10 x 1 = 10mks**



**KERICHO SUB-COUNTY JOINT EVALUATION 2015**  
**KENYA CERTIFICATE OF SECONDARY EDUCATION (K.C.S.E)**  
**443/1**  
**AGRICULTURE**  
**PAPER 1**  
**TIME: 2 HRS**  
**JULY/AUGUST 2015**

**SECTION A (30 MARKS)**

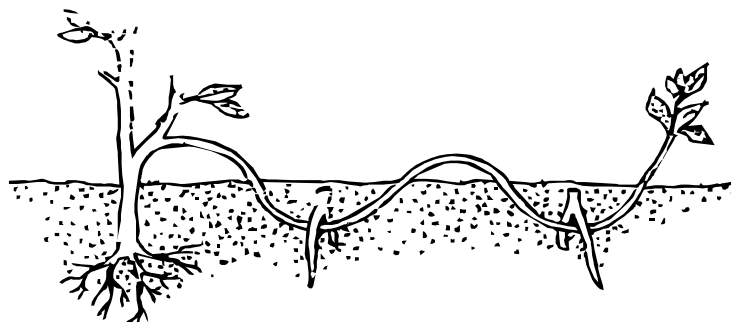
**Answer all questions in this section in the spaces provided.**

1. Define opportunity cost. (1 mark)
2. Outline four factors that influence soil formation. (2 marks)
3. State five roles of agriculture in the Kenyan economy. (2½ marks)
4. State three precautions taken during soil sampling. (1½ marks)
5. State four characteristics of potassic fertilizers. (2 marks)
6. List four factors that determine the time of planting crops. (2 marks)
7. Differentiate between under sowing and oversowing. (1 mark)
8. Explain the following terms:
  - i) Propping (1 mark)
  - ii) Staking (1 mark)
9. State four factors that are considered in determining seed rate. (2 marks)
10. State two harmful effects of weeds in livestock production. (2 marks)
11. Give four reasons why drainage is used as a land reclamation method. (2 marks)
12. State four factors affecting the quality of farm yard manure. (2 marks)
13. Name four methods of fertilizer application in crops. (2 marks)
14. Give four advantages of mulching as used in crop production. (2 marks)
15. State four reasons for carrying out earthing up in crop production. (2 marks)
16. Outline four post-harvest practices in crop production. (2 marks)

**SECTION B: 20 MARKS**

**Answer ALL questions in the spaces provided**

17. The diagram below illustrates a method used in propagating crops through layering.



- a) Identify the method. (1 mark)
  - b) State two suitable characteristics of a mother plant that can be used in this method. (1 mark)
  - c) Outline two advantages of tissue culture as a method of crop propagation. (2 marks)
18. The illustrations below shows various types of weeds. Study them and answer the questions that follow.



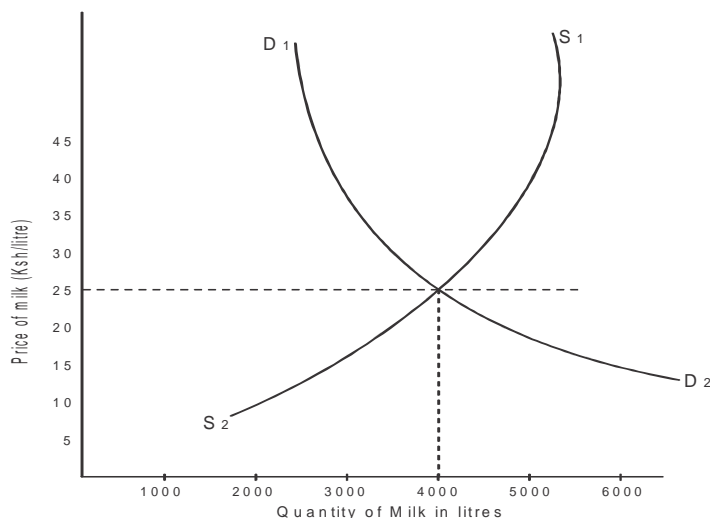
A



B

- a) Identify weed A and B. (1 mark)
- b) Why is it difficult to control weed B? (1 mark)
- c) State one disadvantage of weed labelled B. (1 mark)
- d) Suggest two herbicides that can be used to control weed B. (1 mark)

19. a) A farmer was advised to apply 90kg of  $P_2O_5$ /ha in a field of tomatoes. The fertilizer available is DSP 40%  $P_2O_5$ . Calculate how much DSP the farmer will apply per hectare. (2 marks)
- b) Outline the procedure used in soil sampling. (5 marks)
20. The line graph below shows the relationship between supply and demand of milk in a given town. Study it carefully and answer the questions that follow.



- a) Explain what happens when the price of milk is Ksh 25 per litre. (1 mark)
- b) From the above graph what conclusion can one make about the behaviour of demand for milk in relation to price (2 marks)
- c) From the graph what conclusion can one make about the behaviour of supply of milk in this town in relation to the price. (2 marks)

### **SECTION C-40 MARKS**

#### **Answer ANY two questions from this section**

21. a) Discuss any cultural measures used to control pests on the farm. (10 marks)
- b) Describe the production of onions under the following subheadings:
- Field management (5 marks)
  - Harvesting (5 marks)
22. a) Explain six physical methods that can be used to control crop pests on the farm. (6 marks)
- b) Describe six management practices that should be carried out on a vegetable nursery after sowing seeds until the seedlings are ready for transplanting. (8 marks)
- c) Explain eight factors that can encourage soil erosion. (10 marks)
23. a) State and explain the various land tenure systems practised in Kenya. (5 marks)
- b) State five importance of land preparation. (5 marks)
- c) State five uses of farm records. (5 marks)

**KERICHO SUB-COUNTY JOINT EVALUATION 2015**  
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**443/2**  
**AGRICULTURE**  
**PAPER 2**  
**TIME: 2 HRS**  
**JULY/AUGUST 2015**

**SECTION A (30 MARKS)**

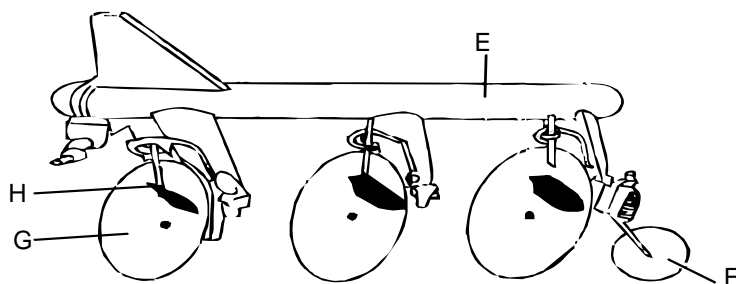
**Answer all questions in this section in the spaces provided.**

1. Name **two** products obtained from a dual purpose breed of sheep. (1 mark)
2. State **four** control measures of fleas in a flock of layers. (2 marks)
3. State **three** reasons for washing the udder of cows before milking. (1½ marks)
4. Name **three** breeding diseases controlled through use of artificial insemination. (1½ marks)
5. Give **two** qualities of a creep feed that make it suitable for piglets. (1 mark)
6. Give **three** factors inhibiting milk let down. (1½ marks)
7. List **four** signs of heat in a female rabbit. (2 marks)
8. a) Name a breed of beef cattle with a red coat colour and a white face. (½ mark)  
 b) Name a breed of pig which is black with a white band around shoulder to forelegs, slightly dished snout and slightly drooped ears. (½ mark)
9. State **three** characteristics of succulent roughage. (1½ marks)
10. Name **one** sheep breed which is resistant to foot rot disease. (1 mark)
11. Give **four** characteristics of a good vaccine. (2 marks)
12. State **four** farm management practices that should be carried out during the mating season in sheep. (2 marks)
13. List **four** qualities of eggs selected for incubation. (2 marks)
14. State **four** features of a good maize granary. (2 marks)
15. State **one** use of each of the following tools/equipment: (2 marks)
  - i) Dibber
  - ii) Cold chisel
  - iii) Pipe cutter
  - iv) Milk churn
16. Outline **three** functions of vitamins in the body of an animal. (1½ marks)
17. Give **four** disadvantages of fold unit system of poultry keeping. (2 marks)
18. Name **three** sources of fats and oil in livestock feeds. (1½ marks)
19. Differentiate between pen mating and flock mating in poultry. (1 mark)

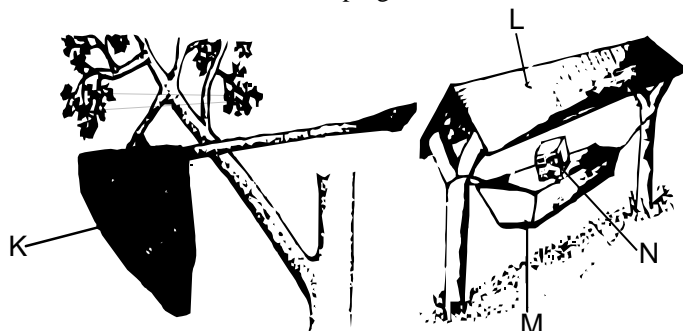
**SECTION B - 20 MARKS**

**Answer ALL questions in the spaces provided**

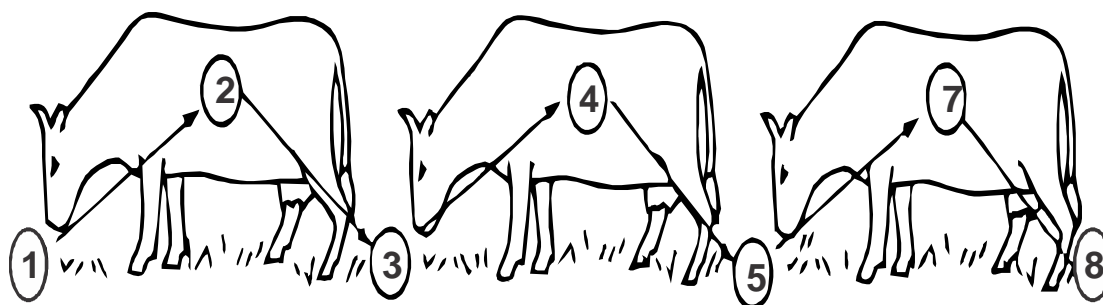
20. Study the illustration below and answer questions that follow.



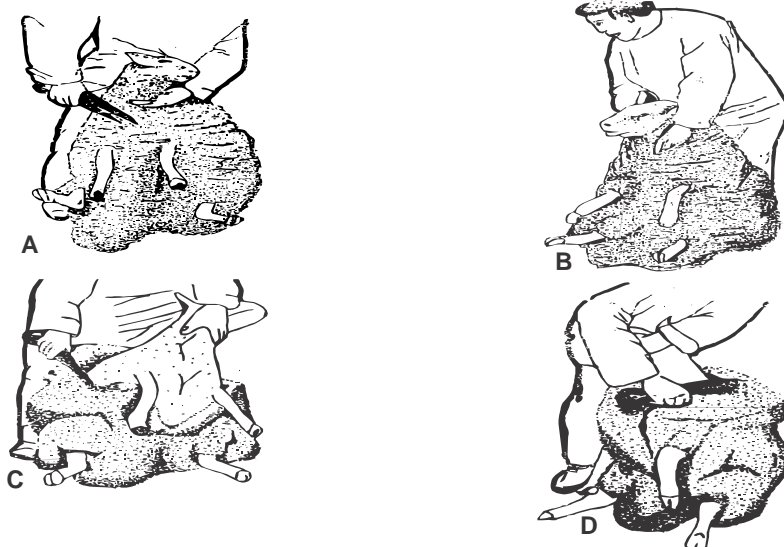
- i) Identify the implement illustrated above. (1 mark)
  - ii) Name the parts labelled E, F, G and H. (2 marks)
  - iii) State **two** methods of adjusting the implement above so as to plough deep. (2 marks)
21. Below is an illustration of a bee keeping structure.



- a) Name the parts labelled K, L, N and M. (2 marks)  
 b) Give two factors that affect the quality of honey. (2 marks)  
 c) Name the type of pests that affect bees. (1 mark)
22. The illustrations below represent the stages of development of a three-host tick. Study it carefully and then answer the questions that follow.



- a) Briefly explain what is happening in the following stages. 1,4,5,8 (2 marks)  
 b) Why do you think that ticks are difficult to control using acaricides. (½ mark)  
 c) Name the most common site the tick can be found on the body of an animal. (2 marks)  
 d) Give two examples of a three host tick. (1 mark)
23. The illustrations below shows the sequence of wool shearing. Study them carefully and answer questions that follow.



- i) Using the letter A, B, C and D in the illustrations above, re-arrange them in the correct order of following during wool shearing. (1 mark)  
 ii) Give two tools/equipment which are required for shearing. (1 mark)  
 iii) State four qualities of good wool. (2 marks)  
 iv) Name one breed of sheep which produces high quality wool. (½ mark)

**SECTION C : 40 MARKS)**

**Answer ANY TWO questions from this section.**

24. a) Outline uses of fences in the farm. (10 marks)  
 b) Describe foot rot(foul-in-foot) under the following sub-heading:  
 i) Animals affected (1 mark)  
 ii) Causal organism (s) (1 mark)  
 iii) Symptoms (4 marks)  
 iv) Control (4 marks)
25. a) Give five advantages of embryo transplant. (5 marks)  
 b) State and explain the structural requirements of a permanent calf pen. (7 marks)  
 c) Explain the functional differences between a disc plough and a mould board plough used in land preparation.(8 marks)
26. a) Outline causes of egg eating in a flock of layers. (7 marks)  
 b) State five uses of lubrication system of tractors. (5 marks)  
 c) Explain eight factors considered when siting farm structures. (8 marks)

**KERICHO SUB-COUNTY JOINT EXAMINATION****AGRICULTURE****Paper 1****July/August 2015****MARKING SCHEME****SECTION A**

- 
1. Define opportunity cost  
It is the value of the forgone alternative used where resources are scarce and the farmer has to choose the most promising (alternative) enterprise *1 x 1 = 1mk*
2. Parent rock material  
Climate  
Topography / nature of land  
Biotic / organic influence / living organism  
Time *1/2 x 4 = 2mks*
3. Roles of agriculture  
– food supply  
– source of employment  
– provision of foreign exchange  
– source of raw materials for industries  
– provision of market for industrial goods  
– source of money or capital *1/2 x 5 = 2 1/2mks*
4.  
– Avoid sampling soils in dead furrows, ditches / and swampy areas  
– avoid recently fertilised fields  
– do not put sampled soil in contaminated containers i.e. with chemicals and fertilizers  
– avoid fence lines or footpaths  
– avoid old manure heaps *1/2 x 3 = 1 1/2mks*
5. State characteristics of potassic fertilizers  
– Area soluble in water hence easily leached  
– have scorching effect on plants  
– due to high solubility, they have no residual effect in the soil  
– are neutral (PH) to the soil i.e. no acidic or alkaline effect on the soil *1/2 x 4 = 2mks*
6.  
– Climate e.g. rainfall patterns  
– Market demand  
– Weed control  
– Pests and disease control *1/2 x 4 = 2mks*
7. Undersowing - it is a farming practice where a pasture crop is established under an existing nurse crop e.g. maize, wheat, sunflower etc.  
Oversowing - is a farming practice of establishing a high quality pasture crop on an existing low quality pasture e.g. lucerne (legume) in rhodes grass *1 x 1 = 1mkmark as a whole*
8. Propping - supporting of banana plant so that they grow upright without lodging  
Staking - a practice of supporting tall varieties of tomatoes to enable them to grow upright. A string and stick is used  
*1 x 2 = 2mks*
9.  
– Spacing of crops  
– Percentage germination of seeds  
– Seed purity i.e. pure seeds use low seed rate  
– Number of seeds to be planted *1/2 x 4 = 2mks*
10. Some weeds are poisonous to livestock e.g. sodom apple and thorn apple  
Some weeds reduce the quality of livestock products e.g. forget me not *1 x 2 = 2mks*
11.  
– Increase soil aeration  
– Increase soil volume  
– To raise soil temperature  
– To increase microbial activities  
– To reduce soil erosion  
– To remove toxic substances *1 x 4 = 4mks*
12.  
– Types of material used during preparation / litter  
– Time taken / age  
– Type of animal
-

- Method of storage
  - Age of the animal  $\frac{1}{2} \times 4 = 2mks$
- 13.**
- side dressing (band placement, ring application)
  - foliar spraying
  - drip method
  - placement method
  - broadcasting  $\frac{1}{2} \times 4 = 2mks$
- 14.**
- conserve moisture
  - regulate soil temperature
  - control soil erosion
  - control growth of weeds
  - improve soil fertility
  - improves soil structure  $\frac{1}{2} \times 4 = 2mks$
- 15.**
- Encourages development and enlargement of root tubers
  - Encourages drainage
  - provides support
  - Conserve moisture  $\frac{1}{2} \times 4 = 2mks$
- 16.**
- drying
  - threshing
  - cleaning
  - sorting and grading
  - dusting
  - packaging / packing  $\frac{1}{2} \times 4 = 2mks$
- SECTION B**
- 17. a) Serpentine / compound layering  $1 \times 1 = 1mk$**
- b) - ability to bend
  - free from pests and diseases  $\frac{1}{2} \times 2 = 1mk$
  - c)
    - production of mass propagules
    - requires less space
    - grow fast
    - establish pathogen free plants  $\frac{1}{2} \times 4 = 2mks$
- 18. a) A - lantana spp (tick berry)**
- B - nut grass (*Cyperus rotundus*)**  $\frac{1}{2} \times 2 = 1mk$
- b) It produces underground tubers / bulbs that remain in the soil for long waiting favourable conditions to propagate
- 1mk**
- c) Lower the quality of pasture / reduce carrying capacity of pasture
- 1mk**
- d)
- Paraquat / gramoxone
  - Glyphosphate / round up
  - 2, 4-D **1mk**
- 19. a) 100kg of DSP = 40kg P<sub>2</sub>O<sub>5</sub>**
- Xkg DSP = 90kg P<sub>2</sub>O<sub>5</sub>**
- 90kg / 40 x 100 = 225kg/ha DSP** **2mks**
- b)
- clear the vegetation from sampling spot
  - Make a vertical cut of 0-15cm for top soil and 15-30cm for sub-soil using soil auger
  - collect the soil using a garden trowel
  - put the soil in a clear container
  - repeat the above steps in different parts of the field about 15-20 spots
  - mix, dry and crush the soil to obtain the sub sample
  - sub-divide the sample, put them in sampling envelope or packet and send to laboratory **1 x 5 = 5mks**
- 20. a) All the supplied milk is bought / all the demanded milk is supplied or**
- The price of milk is at equilibrium  $1mk$**
- b) It is evident that when the price is low the demand of milk increases and when the price is high, the demand decreases
- 2mks**
- b) It is evident that there is direct relationship between the quantity of milk supplied and price or as the price of milk rises, the quantity supplied also rises / when the price falls, the quantity supplied also falls **2mks**

**SECTION C**

21. a)

- timely planting
- timely harvesting
- proper tillage
- close season
- trap cropping
- crop rotation
- planting resistant crop varieties
- field hygiene
- alteration of environmental conditions
- crop nutrition
- destruction of alternate host
- use clean planting material
- proper spacing
- use of organic manure

**1 x 10 = 10mks**

b)

- done 4-5 months after planting / when leaves wither / turn brown
- cut / break and bent this tops at the neck
- harvesting is done by lifting / pulling / digging out the crop
- leave the bulbs on the ground / undershade to dry for 3 days and turn frequently to ensure uniform drying **1 x 5 = 5mks**

**Field management practices**

- mulching to conserve soil and moisture
- erection of shade to minimise evapotranspiration
- weed control to reduce competition with seedling for nutrients, light, space etc
- pest and disease control to ensure healthy and vigorously growing seedlings
- pricking out / thinning to minimise competition for growth elements
- fertilizer application to supplement nutrients in the soil
- watering to ensure adequate moisture supply
- hardening off / removing shade / reducing watering to acclimatize the seedling to conditions in the field
- removal of mulch immediately after germination

**correctly stated 1 x 5 = 5mks**22. a) **Controlling crop pest (physical methods)**

- Trapping / picking and killing the pests
- Use of clean planting
- Use of lethal temperatures to kill the pests
- Flooding to suffocate and kill them
- Use of physical barriers e.g. fences, rat guards etc. to keep the pests away from the crop / produce
- Proper drying to make penetration difficult
- Use explosives to destroy breeding places and kill the pests
- Suffocation - carbon dioxide build up to suffocate pests in stores e.g. cyprus bins

**6 x 1 = 6mks**

b)

- Mulching to conserve moisture
- Erection of a shade to minimise evapotranspiration
- Weed control to reduce competition with seedlings
- Pests and disease control to ensure healthy seedlings
- Pricking out / thinning to minimise competition
- Watering to ensure adequate moisture supply
- Hardening off / removing shade / reducing watering to acclimatise the seedlings to conditions in the field

**6 x 1 = 6mks**

c)

- Lack of ground cover exposes soil to agents of soil erosion / removal of cover crops
- Steep slopes increases the speed of surface run offs hence erosive power of water
- Light / sandy soils are easily carried away by agents of soil erosion
- Shallow soils are easily saturated with water and carried away
- High rainfall intensity on bare ground leads to detachment of soil which is easily carried away
- Frequent cultivation / over cultivation pulverises the soil making it easy to detach and carried away
- Overstocking leads to overgrazing which destroys ground cover exposing it to agents of erosion

**8mks**

23. a)

- Communal land tenure system - land is owned by whole community and clan / tribe
- Cooperative tenure system - land is owned by members who have a common economic interest
- Individual owner operator - land owned by an individual
- Leasehold land tenure system - the owner of land (landlord) leases his/her land to another person (tenant) who uses it or

- 
- Landlordism and tenancy - owner of land (landlord) leases his/her land to another person (tenant) who uses it
  - Concession / company - government gives a company or a corporation the right to use land for a given period of time

**2 x 5 = 10mks**

b)

- To kill weeds
- To improve aeration
- To allow penetration /infiltration of water to the soil
- To bury weeds and allow them decompose to humus
- Improves the soil structure
- To expose the pests to predators and expose them to sun

**1 x 5 = 5mks**

c)

- Use to gauge whether the farm is making profit or loss
- Helps in planning and budgeting
- Proper records can be used to obtain loan from financial institutions
- Use to claim compensation in case of damage / losses
- Helps to determine the debtors and creditors
- Use of to access taxation in or not to overtax or under tax

**1 x 5 = 5mks**



**KERICHO SUB-COUNTY JOINT EXAMINATION****AGRICULTURE****Paper 2****July/August 2015****MARKING SCHEME**

- 
1. - meat / mutton  
- wool *1/2 x 1 = 1mk*
2.  
- dusting the poultry house and laying nests with appropriate insecticides (pyrethrin)  
- ensuring high standards of cleanliness  
- dusting birds with appropriate insecticide  
- applying petroleum jelly on infected parts *1/2 x 4 = 2mks*
3.  
- to stimulate milk let down  
- to remove physical dirt  
- to kill / remove disease causing organisms *1/2 x 3 = 1 1/2mks*
4.  
- Brucellosis / contagious abortion / bangs  
- trichomoniasis  
- vibriosis  
- vaginitis  
- orchitis *1/2 x 3 = 1 1/2mks*
5.  
- highly palatable  
- highly digestible  
- rich in protein / high in nutrients *1/2 x 2 = 1mk*
6.  
- inflicting pain to the animal / beating the animals  
- presence of strangers and animals e.g. dogs  
- poor milking techniques  
- absence of the calf *1/2 x 3 = 1 1/2mks*
7.  
- Restlessness  
- Frequent urination  
- Swollen vulva  
- does throws herself on the sides  
- rubs herself against wall / any solid object  
- does tries to contact others in the next hutch by peeping through the cage walls *any four x 1/2 = 2mks*
8. a) Hereford *1/2mk*  
b) Wessex saddle back *1/2mk*
9.  
- high fibre content  
- low protein content  
- high moisture content  
- high carbohydrate content *1/2 x 3 = 1 1/2mks*
10. Romney marsh *1mk*
11.  
- Immunity it produces should be as good as natural immunity  
- Should have long keeping live / its shelf life should be longer  
- Should be easy to administer  
- Should have no side effects when inoculated  
- Should be compatible with the other vaccines given to the animal  
- A single does should produce lifelong immunity *1/2 x 4 = 2mks*
12.  
- ringing  
- crutching  
- flushing  
- raddling *1/2 x 4 = 2mks*
13.  
- Must be fertile  
- Should be of medium size  
- Should have smooth shell  
- Should be clean
-

- Should be free from any abnormalities (meat spot, bloodspots, double yolk)  $\frac{1}{2} \times 4 = 2mks$
- 14.**  
 Water proof roof / leak proof roof  
 Easy to clean and keep clean  
 Have proper ventilation  
 Vermin proof / with metal deflectors  
 Well-built to contain load / strong enough  
 Easy to load and offload / easy entry  
 damp proof / raised above the ground  
 Well lit  $\frac{1}{2} \times 4 = 2mks$
- 15. a)**  
 – Dibber - making holes for planting  $\frac{1}{2}mk$   
 – Cold chisel - cutting thick sheet of metal  $\frac{1}{2}mk$   
 – Pipe cutter - cutting PVC (polyvinyl chloride) / plastic pipes  $\frac{1}{2}mk$   
 – Wire strainer - tightening wires during fencing  $\frac{1}{2}mk$   
 – Milk churn - holding milk on transit  $\frac{1}{2}mk$
- 16.**  
 - promotes growth  
 - helps in blood clotting  
 - help in bone formation  
 - help in muscular activity  
 - prevent diseases in animals  
 – act as organic catalysts  $\frac{1}{2} \times 3 = 1\frac{1}{2}mks$
- 17.**  
 - few birds are kept per food  
 - laborious in moving folds  
 - difficult to keep egg production records  
 - folds are not long lasting  $\frac{1}{2} \times 4 = 2mks$
- 18.**  
 – Oil seeds by products (cotton seedcake, sunflower etc)  
 – Animal products (milk, bone, meat and fish meal)  
 – Foliage of pastures  $\frac{1}{2} \times 3 = 1\frac{1}{2}mks$
- 19.** - pen mating is the use of only one cock to mate a flock of hens  
 - flock mating is where two or more cocks are used to mate hens  $\frac{1}{2} \times 2 = 1mk$
- SECTION B :**
- 20. i) Disc plough  $1mk$**   
 ii)  $E - beam$   
 F - depth / furrow wheel  
 G - disc  
 H – scrapper  $\frac{1}{2} \times 4 = 2mks$   
 iii)  
 – Adjusting by raising the depth wheel  
 – Adjusting the angle of the disc  
 – Lengthening the top link  
 – Adding weight to the plough beam  $1 \times 2 = 2mks$
- 21. a)**  $K - swarm net$   
 L - roof / shed  
 M - Kenya top bar hive  
 N - catcher box / syrup / sucrose container  $\frac{1}{2} \times 4 = 2mks$   
 b)  
 – Method of extraction  
 – Type of flowers from which the nectar was collected  
 – Season of the year - (honey formed over dry season tends to lower quality)  
 – maturing age of honey (mature honey is of good quality)  $1 \times 2 = 2mks$   
 c)  
 – Ants  
 – Wax moth  
 – Bee louse  
 – Honey badgers  $\frac{1}{2} \times 2 = 1mk$
- 22. a) 1 - eggs hatch larvae emerge**  
 4 - Nymph climb onto a 2nd host and feed  
 5 - engorged nymphs drop down to lay  
 8 - engorged female drops to lay eggs  $\frac{1}{2} \times 4 = 2mks$

- b) Ticks keeps on dropping off the animals at every stage of development, so it is not affected by acaricides when the animals is sprayed / dipped  $\frac{1}{2}mk$
- c) - ears
- Base of the horns
  - Around the eyes
  - Tail switch  $\frac{1}{2} \times 4 = 2mks$
- d) - brown ear tick
- bont tick
  - east Africa bont tick
- $\frac{1}{2} \times 2 = 1mk$

23. i) B, A, D and C **1mk (all steps must be written)**

- ii) - wool shears  $\frac{1}{2} \times 2 = 1mk$
- weighing scale
- iii) - strong
- long
  - wavy
  - white colour
  - free from foreign materials

$\frac{1}{2} \times 4 = 2mks$   
 $\frac{1}{2}mk$

iv) Merino

**SECTION C**

24. a)

- used to demarcate the farm land from that of neighbours
- used to keep off wild animals and other initiatives from outside the farm
- used to separate crop fields from pasture facilitating mixed farming
- used to divide pasture fields into paddocks facilitating rotational grazing
- control movements of animals and people preventing formation of unnecessary paths
- help control the spread of parasites and diseases by keeping off wild and stray animals
- help to isolate sick animals from the rest of the herd to prevent disease spread
- enable farmers to control breeding by rearing different animals in different paddocks
- provide security to the homestead and farm animals
- adds an aesthetic value to the farm

$1 \times 10 = 10mks$

b) i) Cattle, sheep, goats **1mk**

ii) Fusiformis necrophonis

Fusiformis nodusus

Accept bacteria

$\frac{1}{2} \times 2 = 1mk$

iii)

- foot becomes swollen
- lameness is observed
- presence of pus and rotten smell on foot around hooves
- animal e.g. sheep may be seen kneeling when grazing
- animal lies down when hindquarters are affected
- emaciation

$1 \times 4 = 4mks$

iv)

- avoid damp and muddy conditions
- carry out regular foot examination and hoof trimming
- treat wounds on feet with antiseptics / sick animals are given antibiotic injection
- isolation of sick animals
- keep sheep in dry clean area

$1 \times 4 = 4mks$

25. a)

- stimulates milk production in females that are ready to produce milk
- a highly productive female can be spread over a large area to benefit many farmers
- easier to transport embryos in test tubes than whole animal
- embryos can be stored for long periods
- possible to implant embryo from a high quality female to less valuable females / improves performance of offspring

b)

- adequate space - for exercises, feeding and watering equipment
- single housing - prevents licking of each other resulting in formation of hair balls in rumen / spread of worms / skin infection
- proper lighting - synthesis of vitamin D
- proper drainage - avoid dampness which brings infection
- draught free - to avoid predisposing calves to infections such as pneumonia
- leak proof roof - avoid wetness which encourages disease infections such as pneumonia, navel illness and scours
- cleanliness - those made of concrete are easy to clean

- proper ventilation to allow fresh air circulation

**1 x 7 = 7mks**

c) Disc plough

Mouldboard plough

- |   |   |
|---|---|
| 1. Can be used in field with obstacles                      | - cannot be used in field with obstacles            |
| 2. Ploughs and varying depths                               | - cuts at uniform depth                             |
| 3. Poor furrow slice inversion / leaves a rough field field | - proper furrow slice inversion / leaves a clean    |
| 4. More harrowing / secondary operations required           | - fewer harrowing / secondary operations required   |
| 5. Requires less power to pull                              | - require more power to pull                        |
| 6. Not easily broken by obstacles                           | - easily broken by obstacles                        |
| 7. Works well in sticky soils                               | - does not work well in sticky soils                |
| 8. Does not require constant replacement of parts share     | - requires constant replacement of parts especially |

**1 x 8 = 8mks**

26. a) - presence of broken / soft shelled eggs

- bright light in nest
- idleness
- inadequate nests forcing birds to lay eggs on the floor
- lack of minerals such as calcium
- irregular collection of eggs
- overcrowding forcing hens to lay eggs on the floor
- feeding hens with broken eggs will encourage them to eat eggs

**1 x 7 = 7mks**

b) - increases efficiency of the machine

- reduces rate of wear and tear of moving parts
- reduces heat generated on rubbing surfaces
- act as a cleaning agent / washes off dirt, dust soot and metal chippings
- prevent rusting of stationary machines

**1 x 5 = 5mks**

c) - the location of the homestead

- accessibility
- security
- drainage
- relationship between the structures
- farmers tastes and preferences
- proximity of amenities i.e. electricity and water supply
- topography

**1 x 8 = 8mks**

**should be well explained**

**KANDARA SUB COUNTY FORM 4 2015 JOINT EXAMINATION***Kenya certificate of secondary education (k.c.s.e)***AGRICULTURE****Paper - 443/1****JULY/AUGUST 2015****MARKING SCHEME****1. Conditions for land reclamation**

- Very steep. land
  - Water logging/marshy area
  - Forested/bushy area
  - Rocky/aridity/Tsetse fly infested areas
- 4x½=2mks

**2. How biological agents enhance soil formation**

- Movement of animals in large numbers
  - Decomposition of plants and animal remains by microorganisms
  - Physical breaking of rocks by roots of higher plants.
  - Man's activities e.g cultivation, mining and road construction
  - Mixing up of soil by soil burrowing animals e.g earthworms and termites.
- Any 3x½=1½mk

**3. Mechanical methods of separating soil particles**

- Using a sieve/sieve analysis
  - sedimentation method
- 2x½=1mk

**4. Benefits of possessing a land title**

- Can be used as security for credit
  - Encourages long term investments
  - Reduces land disputes
  - Motivates the farmer to conserve soil and water
- Any 2x½=1mk

**5. Factors considered when classifying crop pest**

- Crop attacked /mode of feeding
  - Whether field or storage pest
  - Crop parts attacked
  - Stage of crop growth attacked
  - Scientific identification e.g insects, mites, rodents
- Any 3x½=1½mks

**6) Functions of boron**

- Important in calcium utilization
  - Necessary in sugar translocation
  - Needed in water absorption
  - Aids in translocation of sugar, nitrogen and phosphorus
  - Aids in fruit development
- Any 3x½=1½mks

**7. Advantages of tissue culture**

- Plantlets maintain parental characteristic
  - Resultant plants are free from disease causing organisms.
  - Facilitates mass production of propagules
  - A small space can be used to raise many propagules
  - Resultant plant products are of high quality
- Any 4x½=2mks

**8. Indicators of economic development**

- Development of infrastructure
  - Housing status of the citizens
  - Increase in recreation facilities
  - Ratio of teachers to students
  - Improvement in the level of technology
- Any 4x½=2mks

**9. Factors that influence the price of an agricultural commodity.**

- Price of substitutes
  - Price expectation in future
  - Quality of the commodity
  - Tastes and preferences of the commodity
- Any 3x½=1½mks

**10. Examples of leguminous fodder crops**

- Leucaenia
- Calliandria
- Atriplex

- Sesbania Any 3x½ = 1½mks
- 11. Factors that determine the size of a pit for silage making.**
- Quantity of forage available for ensiling
  - Number of animals to cater for
  - length of the period of forage scarcity
  - bulkiness of the material Any 2x½ = 1mk
- 12. Reasons for controlling weeds in pastures**
- To avoid poisoning of livestock
  - To minimize disease spread
  - To ensure the forage is of high palatability
  - Minimize competition for nutrients, spaces and light.
  - To increase the lifespan of the pasture Any 3x½ = 1½mks
- 13. Benefits of agro forestry**
- Source of wood fuel
  - Trees can be sold to earn income
  - Nitrogen fixation by leguminous shrubs
  - Improve aesthetic value of the land
  - Some species like calliandra act as fodder
  - Some trees are source of nectar for honey bees
  - Trees help in soil and water conservation Any 4x½ = 2mks
- 14. Qualities considered when selecting seeds for planting**
- Should be of high quality
  - Should be free from pests and diseases attack
  - Should be mature
  - Should be of appropriate size
  - Should be free from any physical damage
  - Should be of high percentage germination
  - Should be suitable to the ecology of the area any 4x½ = 2mks
- 15. Advantages of land consolidation**
- No time is wasted moving from one piece of land to another.
  - Promotes mechanisation
  - Long-term investments can be made on the farm
  - Supervision of land is easily done
  - Facilitates soil and water conservation and land improvement
  - Enhances control of pests and diseases
  - Registration can easily be done followed by issuance of title deeds. Any 4x½ = 2mks
- 16**
- a) Practices which encourages soil erosion**
- over cultivation, overstocking/overgrazing
  - Deforestation/planting annual crops on steep slopes.
  - Burning of the vegetation
  - Ploughing up and down the slope Any 4x½ = 2mks
- b) Forms of gulley erosion**
- V- shaped gullies
  - U- Shaped gullies 2x½ = 1mk
- 17. Benefits of budgeting to a farm manager**
- Helps to establish the capital required for a certain production process
  - It enables access to credit
  - Can determine the level of taxation
  - Can predict the expected income
  - Facilitates better decision making
  - Can be used to detect weakness
  - As a record for future reference Any 4x½ = 2mks
- 18. Reason for carrying out**
- a) Rolling**
- Increases seed soil contact
  - Reduces soil erosion (2x½ = 1mk)

**b) Sub soiling**

- breaking hardpans
- Brings leached minerals near the surface for use by plants 2x½=1mk

**c) Ridging**

- Conserves soil and water
- Encourage root development 2x½=1mk

**SECTION B****19 A) Identification**

- A Aphid
- B Quelea Quelea bird 2x1=2mks
- b) Crops attacked by pest labelled A  
kales, cabbages, maize, sorghum 1x1=1mk
- C) Cultural method used to control pest B  
Growing goose necked sorghum 1x1=1mk

**20 a) Law of diminishing returns**

- States that when successive units of one input are added to fixed quantities of other inputs a point is eventually reached when the additional product per additional unit of input will decline. 1mk mark as a whole

**b) (i) Point at which the farmer should stop applying**

At the end of the third unit of fertilizer application 1mk

**(ii) Reason for answer above**

This is the least profitable unit of fertilizer application beyond which there will be a loss 1mk

**(iii) Calculate marginal returns**

$MR = KSHS \frac{1200 \times 2}{2} = 2400/=$  2mks

**21) Procedure followed in spraying a crop using fungicide powder.**

- Read and follow manufacturers instructions
- Measure the required amount of fungicides .
- Place it into the container and mix thoroughly until the powder has dissolved completely
- Pour the mixture into the knapsack sprayer through the sieve
- Strap the knapsack to the back
- Spray the mixture onto the crop Each ½mk

**b) Fungal disease that can be controlled using the above procedure**

- Blight (late or early ) 1x1=1mk

**22****a) Number of rows**

$$\frac{540 - 60 + 1}{40} \text{ (1mk)}$$

40

$$= 13 \text{ rows} \quad \text{(½mk)}$$

**b) Total of seedlings**

$$\frac{1020 - 60 + 1}{30} \quad \text{(1½mk)}$$

30

$$= 33 \text{ plants per row}$$

$$\text{Total number of seedlings} =$$

$$13 \times 33 = 429 \quad \text{(1mk)}$$

**23 a) Method of crop propagation illustrated**

Serpentine layering (1mk).

**b) Conditions that the above methods should be used.**

- Many planting materials or propagules are required.
- The plant part is tender and can give in to bending without breaking.
- Each exposed portion must have atleast one bud to develop into a shoot. (3x1=3mks)

**SECTION C (40MKS)**

- Process of water treatment

**24****a) Filtration at intake**

Water passes through a series of screens that trap large particles

**b) Softening of water**

- Water is rapidly mixed in an open tank and soda ash is added to soften it. Aluminium sulphate (Alum) is added to

- cause tiny particles to coagulate
- c) **Coagulation and sedimentation**  
Alum added in the previous stage causes coagulation and sedimentation ie particles clump together and settle at the bottom **of the tank. Water stays in this for atleast 36 hours to kill bilharzias worm.**
- d) **Second Filtration**  
- **Water passes through sand and gravel that removes all the remaining solid particles**
- e) Chlorination  
- Filtered water enters into the chlorination tank where chlorine is added to kill disease causing microorganisms.
- f) **Storage**  
Treated water is stored in large tanks awaiting conveyance to areas of use  
- Stating (1mk)  
- Explanation (1mk)
- b) **Conservation measures used to maintain soil**  
- Terracing -To reduce surface flow speed of water and hence its erosive power  
- Cut off drains- They direct water runoff from cultivated slopes through channels  
- Stone lines- trash/crop residue/stones heaped along contours trap eroded soil.  
- Gabions- boxes made of wire mesh filled with stones built across gullies to trap soil and reduce the speed of run off.  
- Dams walls built across the valley to hold water  
- Mulching - covering the soil with dry vegetation to reduce the speed of run off.  
- Cover cropping- They form a cover on the soil which protects it against splash erosion  
- Filter strips- uncultivated strip of land left intentionally across the slope along the contour planting rows reduce speed of water and trap soil. 8x1=8mks
- 25 a) **Precautions taken when harvesting the following crops**
- i) **Cotton**  
- Picking should not be done when wet  
- Pick on weekly basis for maintenance of quality  
- Avoid using sisal bags  
- avoid mixing of seed cotton with leaves and twigs 2x1=2mks
- ii) **Pyrethrum**  
- Avoid compacting the flowers after picking them.  
- Use woven baskets  
- Avoid picking wet flowers  
- Only pick flowers whose 2-3 disc florets have opened. 2x1=2mks
- iii) **Sugarcane**  
- Take the cane to the factory within 48-72 hours after harvesting.  
- Cut the cane as close as possible to the ground level  
- Cutting should be done at the right stage of maturity 18-22 months  
- Avoid excessive burning of the cane in the field. 2x1=2mks
- iv) **Tea**  
- Use woven baskets  
- Avoid compacting the tea leaves  
- Spread the plucked tea under shed  
- Pluck two leaves and a bud  
- Take the plucked tea to the factory on the same day 2x1=2mks
- b) **Ways in which wind negatively affect agriculture**  
- Wind increases the rate of evapotranspiration  
- Causes lodging of cereals  
- Blows away rain bearing clouds  
- Spreads weeds  
- Destroy farm structures Any four
- c) **Advantages of mixed pastures**  
- It is more palatable  
- Has a higher nutritive value  
- Total failure is rarely experienced  
- total yield is comparatively higher  
- Improves soil fertility as legumes fix nitrogen Any four
- 26 a) **Balance sheet**



Balance sheet for maiposis's farm as at 31st  
Septemer 2007.

| ASSETS                | SHS    | CTS | LIABILITIES                   | SHS        | CTS        |
|-----------------------|--------|-----|-------------------------------|------------|------------|
| <b>Current assets</b> |        |     | <b>Short term liabilities</b> | <b>Shs</b> | <b>cts</b> |
| Cash at hand          | 5000   | 00  | Bank overdraft                | 40000      | 00         |
| Grains in store       | 80000  | 00  | Debts payable                 | 26100      | 00         |
| Dairy cattle          | 150000 | 00  | Total                         | 66100      | 00         |
| Cash in bank          | 50000  | 00  |                               |            |            |
| Debt receivable       | 12500  | 00  | Long-term liabilities         |            |            |
| Layers                | 30000  | 00  | Net worth                     | 926400     | 00         |
| Total                 | 192500 | 00  |                               |            |            |
| Fixed assets          |        |     |                               | 992500     | 00         |
| Land                  | 500000 | 00  |                               |            |            |
| Lorry                 | 300000 | 00  |                               |            |            |
| Total                 | 800000 | 00  |                               |            |            |
| Total                 | 992500 | 00  |                               |            |            |

**b) Production of carrots (*Daucus carota*) under varieties**

- Fresh market
- Canning
- Field management
- Thinning should be done two weeks after germination.
- Weed control - The field should be kept weed free
- Control of pests
- Green aphids are found at the base of leaves and can be controlled by use of appropriate pesticides.
- Watering should incase there is no adequate rainfall
- Harvesting
- Carrots are ready for harvesting three to five months after planting depending on the variety.
- They are harvested by lifting the plants out of the ground using a fork jembe or uprooted manually.

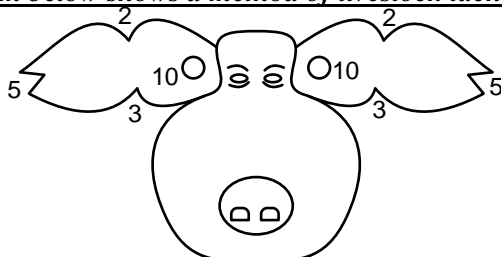
**KANDARA SUBCOUNTY FORM 4 2015 JOINT EXAMINATION***Kenya certificate of secondary education (k.c.s.e)***AGRICULTURE****Paper - 443/2****JULY/AUGUST 2015****MARKING SCHEME****SECTION. A (30 MARKS)**

1. **Mention four components of milk.** (2mks)
  - Water
  - Casein/protein
  - Milk sugar/Lactose
  - Milk fat/Butter fat (4x½=2mks)
2. **Name two factors which can inhibit milk Let down process in dairy cattle.**
  - Unfamiliar noises, strangers during milking.
  - Beating up the cow at milking parlour.
  - Taking more than 8-10 minutes to milk. (2x½=1mks)
3. **Explain how dry cow therapy is carried out.** 1mk
  - Anti Mastitis drugs are infused through the teat canal at the beginning of dry period to prevent mastitis. 1x1=1mk
4. **Give two functions of the differential in a tractor** (1mk)
  - Transmission of power from the drive shaft to the rear wheel through the axle.
  - Enables rear wheels to rotate independently
  - Adjusts the motion speed as opposed to engine speed.
5. **Mention four implements which can be attached to the power take off shaft of a tractor.** 2mks
  - Mower
  - Water pump
  - Maize Sheller
  - Boom sprayer
  - Generator (4x½=2mk)
6. **Give three fields conditions under which a disc plough would be more suitable to use than a mould board plough.**
  - Wet soil
  - Sticky soil
  - Hard ground
  - Presence of obstacles/roots/rocks
  - Ground covered by trash (3x½=1½)
7. **Mention three problems associated with air -cooled tractor engines.** (3x½=1½mks)
  - Production of less power
  - Quick overheating
  - Inadequate cooling when doing heavy work
8. **State three adjustments that should be carried out on a tractor mould board plough to increase depth of ploughing.**
  - Exerting more hydraulic pressure.
  - Lowering the ploughing pitch.
  - Decreasing top link length.
  - Filtering disc coulter.
9. **State four advantages of a hedge fence.** (2mks)
  - Takes too long to establish .
  - Occupies a lot of land.
  - Can be a hiding place for thieves, rodents.
  - Requires regular trimming.
  - Competes with crop plants.
  - Can cause injury to human beings, livestock.
  - Can be destroyed by pests. (4x½=2mks)
10. **State four construction features necessary in a fish pond.** (2mks)
  - An outlet to drain (off ) excess water
  - An inlet for fresh water supplies
  - A spillway channel to take away excess water .

- A screen to prevent escape of fish/entry of star fish.
  - A fence to keep off predators, unauthorised persons.
  - A dyke/dam wall. (4x½=2mks)
11. **Name four structures which are used in the control of livestock parasites on a farm.** (2mks)
- Dips
  - Sprays races (4x½=2)
  - Crush
  - Fences
12. **Give two uses of guard rails in a pig farrowing pen.**
- Prevents sow from crushing piglets.
  - Prevents sow from eating creep feed. (2x1=2mks)
13. **List two equipments used in handling cattle during an agricultural exhibition.** (1mk)
- Halter
  - Rope
  - Bull ring/Nose ring and lead stick (2x½=1mk)
14. **Give one functional difference between:**
- a) Weighing balance and weighting band
- Weighing balance is used to weight things such as milk, crop produce, fertilisers, while a weighing band is used to estimate weight of farm animals. (1x1=1mk)
- a) Sickle and Secateurs
- A sickle is used to harvest cereal crops or cut back pyrethrum, while secateurs is used to cut back soft suckers.(1x1=1mk)
15. **Give four ways in which disease causing organism can gain access into a newly born calf.(2mks)**
- Through the mouth, eye, ears
  - Through umbilical cord
  - Through respiratory tract
  - Through injury/wounds on the body (4x½=2mks)
16. **State four functions of worker bees in a bee colony.** (2mks)
- Feeding the brood, Queen.
  - Protecting the hive from intruders.
  - Collecting nectar, pollen grains, gums, water.
  - Cleaning the hive.
  - Building combs and sealing cracks.
  - Making honey and bee's wax.
  - Scouting for a new home (4x½=2mks)
17. **Differentiate between homogenisation and pasteurisation in milk processing.** (2mks)
- Homogenisation is the mechanical breakdown of large fat globules in milk into small fat particles, which are then evenly distributed in milk.
  - Pasteurization is the heating of milk to a certain temperature followed by chilling in order to kill harmful bacteria that spill milk. (1x2=2mks)
18. **State five qualities of colostrums which make it suitable for calves soon after birth.** (2½mks)
- Highly palatable
  - Highly nutritious
  - Highly digestible
  - Rich in antibodies
  - Colostrum cleans the calf's digestive system. (5x½=2½)

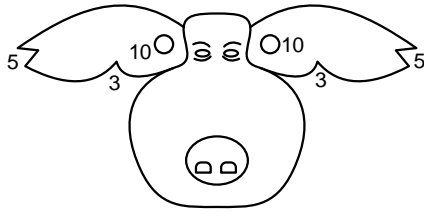
### **SECTION B. (20 MARKS)**

19. **The diagram below shows a method of livestock identification . Use it to answer the questions that follows.**

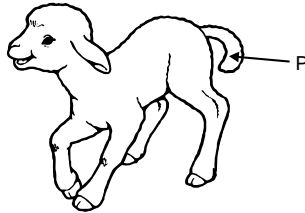


- a) Identify the method of identification illustrated above. (1mk)

- Ear notching 1x1=1
- b) Give the identification number of the animal illustrated above.
- 40 (1x1=1mk)
- c) Using a diagram, illustrate how to identify animal number 36. (1x1=1mk)

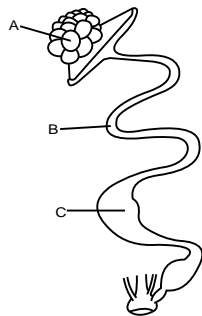


20. The diagram below shows sheep with a part labelled P.



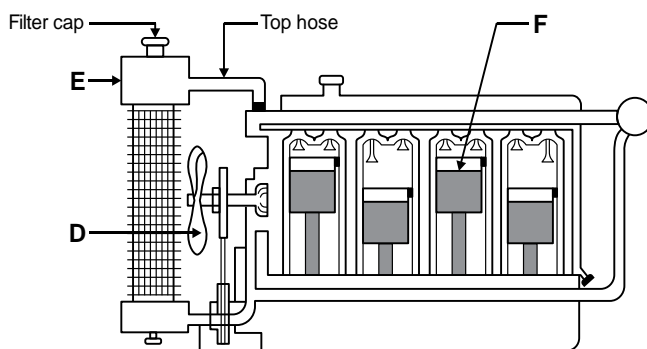
- a) Name the operation which is usually carried out on the part labelled P. (1mk)
- Tail docking (1x1=1mk)
- b) At what age of sheep should the operation named above be carried out? (1mk)
- Within the first 2 weeks (1-14 days) (1x1=1)
- c) Explain two methods used to carry out the operation named in (a) above. (2 mks)
- Using a rubber ring and elastrapor
- Cutting with a sharp sterile knife. (2x1=2mks).

21. The diagram below shows the reproductive system of a hen.



- a) Name the parts labelled A, B and C (3mks)
- A - Ovum/Mature York
- B - Magnum
- C - Uterus/Shell gland (3x1=3mks)
- b) Describe one use of each of the parts labelled. B and C (2mks)
- B - Egg abumen is added (1x1=1mk)
- C - Add egg shell to the egg (1x1=1mk)

22. Below is the cooling system of a tractor engine with parts labelled B, E and F.



- a) Identify the parts labelled D, E and F. (3mks)  
 D -Fan  
 E -Head tank  
 F -Piston
- b) Explain the functions of the above named parts labelled D.E and F. (3mks)

22.

- D -Blowing cool air currents through fins to cool engine.  
 E -Holds/stores water for the cooling system.  
 F -Compresses fuel-air mixture within the cylinders.

c) Give two importances of cooling system in a tractor engine.

- Prevents overheating of engine parts.
- Maintains efficiency. 2x1=2mks

**SECTION C (40 MARKS)**

23.) Hand tools required for the construction of a wooden hut.

a) Claw hammer for driving nails into the wood/removing nails from wood.

- Tin snip for cutting sheet metal.
- Pliers for cutting wire.
- Mallet -for hitting wood chisel when cutting grooves in wood.
- Wood chisel- for cutting grooves in wood or bevelling.
- Jackplane -for smoothening straight wood surfaces,
- Tape measure/Ruler -for measuring lengths of materials to be used.
- Crosscut saw- for cutting wood into pieces required.
- Clamp- for holding pieces of wood together when cutting/joining wood.
- Screw driver- for driving screws in wood or removing screws from wood.
- Try square- for measuring right angles.
- Spirit -level to determine horizontal or vertical straightness.
- Marking gauge- for drawing lines on wood.
- Scriber -for drawing marking lines on metal sheet. 10x1=10mks

b) **How the following tractor components are used to attach implements to the tractor.**

i) **Three point linkage**

- The three point linkages are used to attach trailed or mounted implements onto the tractor.
- The lower links are hitched to the lower links of the implement, while the top (adjustable) one is attached to the top link of the implement.
- The top adjustable link of the tractor is used to lift the implement through the hydraulic power system when in operation or when transporting an implement.
- The two lower not adjustable links are used to hold the implement in place and provide stability.
- The check chains on the lower links are used to prevent the implement from getting into contact with the tractor tyres, when the tractor is moving. 3x2=6mks

ii) Power Take off shaft

- PTO is used to transmit power to operate various mounted and stationary implements from the tractor to the implement.
- the extension shaft of the PTO connect the PTO shaft to the implement shaft.
- The extension shaft has universal joints at both ends which are used for adjusting the distance between the tractor and the implement. 4x1=4
- The short splined shaft at the rear of the tractor is also used for attaching/coupling to the implement.

Features of an ideal calf pen

24.(a) Concrete/raised slatted floor to maintain cleanliness.

- Leakproof roof to maintain dryness.
- Dry bedding/litter to maintain warmth.
- adequate space to allow for exercise feeding, watering.
- Proper lighting/Good supply of natural light for sunning.
- Proper drainage in and around the pen to facilitate free flow of water and urine to avoid dampness.
- Draught free to prevent strong winds from blowing into the calf pen.
- Proper ventilation to allow for fresh air circulation.
- Security to keep away intruders/wild animals.
- Single housing to prevent licking which leads to formation of hairballs in the rumen. 9x1=9

(i) Pneumonia in calves under

- predisposing factors

**b) (i) Overcrowding in the pens**

- Dampness/chilliness in the pen.
- Poor ventilation
- Age/Younger calves are more prone than old ones.
- Effects of diarrhoea and other illness. 3x1=3mks

Symptoms

**ii) Rough hair coat**

- Loss of appetite
- Abnormal lung sounds/whizzing
- Emaciation
- Frequent coughing
- Abnormal nasal discharge
- Fluctuating body temperature
- Rapid breathing/laboured breathing
- Dull and reluctant to move. (5x1=5mks)

Control Measures

**iii) Treating sick calves with antibiotics.**

- Providing warmth in pens
- Maintaining good sanitation in pens
- Isolating sick calves to avoid spread
- Prevent draught. 3x1=3mks

**25. (a) Differences between a diesel and petrol engine.**

| Diesel Engine   | Petrol Engine  |
|---|--|
| - Uses diesel   | Uses petrol  |
| - Ignited by compression                              | Ignited by spark plugs                               |
| - Compression ratio is high                           | -Compression ratio is low                            |
| - Less efficient in fuel burning/produces more smoke. | -More efficient in burning fuel/produces less smoke. |
| -Has an injector pump                                 | Has a carburettor                                    |
| - Has sediment bowl                                   | Lacks sediment bowl.                                 |
| - Heavy, hence suitable for heavy duties.             | -Light, therefore suitable for light duties.         |
| - Has no spark plugs                                  | -Has spark plugs                                     |
| - Fuel and air are mixed in the cylinder.             | -Fuel and air mixed in the carburettor.              |
| Only air is compressed                                | Air- fuel mixture is compressed.                     |

**b) Causes of stress in poultry**

- Sudden change in routine management
- Outbreak of diseases and parasitic infection
- lack of food and water
- Presence of strangers and predators in the birds house.
- Sudden noise
- Overcrowding
- Sudden climatic changes
- Poor lighting in the poultry house
- Unbalanced diet
- Introduction of new birds
- inadequate laying nests 10x1=10mks

**MAARA FORM FOUR JOINT EXAMINATION***Kenya Certification of Secondary Education***AGRICULTURE****Paper - 443/1****July/August 2015****Marking Scheme**

- 
1. Factors affecting rooting of cutting.
- Leaf area.
  - Oxygen supply
  - Temperature
  - Light intensity
  - Chemical treatment
  - Relative humidity *4 × ½ = 2 marks*
2. Disadvantages of using organic manures
- Manures are bulky
  - Requires a lot of labour for the application and transport.
  - Spread diseases, pests and weed.
  - Take long to fully decompose and hence release nutrients.
  - If poorly stored, it loses nutrients. *3 × ½ = 1½ marks*
3. Advantages of mixed farming
- Diversification of production.
  - Mutual benefit between crops and livestock.
  - Better utilization of land.
  - Farmers gets income throughout the year.
  - Proper utilization of labour. *3 × ½ = 1½ marks*
4. Information found in a title deed
- Name of owner.
  - Location of the parcel of land.
  - Size of the land.
  - Type of ownership
  - Date of issue.
  - Place of issue.
  - Signature of issuing officer. *3 × ½ = 1½ marks*
5. Types of inventories
- Consumable goods inventory.
  - Permanent goods inventory. *2 × ½ = 1 mark*
6. Cultural methods of weed control
- Mulching.
  - Cover cropping
  - Crop rotation
  - Timely planting.
  - Use of clean planting materials.
  - Correct / proper spacing.
  - Field hygiene.
  - Flooding. *4 × ½ = 2 marks*
7. Factors determining demand for a commodity
- Population
  - Income
  - Advertisement
  - Tastes and preferences.
  - Perishability.
  - Price expectation
  - Future expectation / uncertainty
  - Price of related good.
  - Beliefs, customs and taboos. *4 × ½ = 2 marks*
8. Uses of water in the farm
- Irrigation
  - Processing of crops.

- Domestic use.
- Diluting chemicals
- Clearing farm structures.
- Watering livestock
- Mixing of concrete
- Cooling engines.  $3 \times \frac{1}{2} = 1\frac{1}{2}$  marks
- 9. Agents of weathering**
- Physical agents.
- Biological agents.
- Chemical weathering.  $3 \times \frac{1}{2} = 1\frac{1}{2}$  marks
- 10. Practices used to reclaim land for agricultural production**
- Tsetsefly control.
- Drainage of water from waterlogged soils.
- Irrigation of dry areas.
- Bush clearing.  $2 \times \frac{1}{2} = 1$  mark
- 11. Observable indicators of economic growth**
- Development of infrastructure.
- Increase in recreation facilities.
- Improved level of technology.
- Improved housing status to citizen.  $2 \times \frac{1}{2} = 1$  mark
- 12. Practices used to train plants.**
- Trellising.
- Staking
- Propping.  $2 \times \frac{1}{2} = 1$  mark
- 13. Factors affecting the efficiency of pesticides.**
- Weather conditions at the time of application.
- Timing of application
- Persistence
- Concentration  $4 \times \frac{1}{2} = 2$  marks
- 14. Conditions under which clearing of land is necessary.**
- If stalk growing crop was previously planted.
- If land has been fallow for long.
- Long interval between primary and secondary cultivation.
- Opening up virgin land.  $3 \times \frac{1}{2} = 1\frac{1}{2}$  marks
- 15. Deficiency symptoms of sulphur in plants.**
- Stunted growth.
- Leaf chlorosis followed by production of athocyamin.
- Thin stems.
- Reduced nodulation in stems.  $3 \times \frac{1}{2} = 1\frac{1}{2}$  marks
- 16. Management practices carried out in pastures.**
- Topping.
- Weed control
- Irrigation
- Pests control
- Disease control
- Top dressing.  $4 \times \frac{1}{2} = 2$  marks
- 17. Methods of improving labour productivity.**
- Supervision
- Mechanisation
- Training
- Giving incentives and improving farms and conditions of services.  $4 \times \frac{1}{2} = 2$  marks
- 18. Factors determine the stage of crop harvested.**
- market price
- weather conditions
- market demand
- purpose /intended use.
- concentration of required chemical
- taste and preferences.  $2 \times \frac{1}{2} = 1$  mark



**19. a)**

- bund along the contour

 $1 \times 1 = 1$ **b)-** Trash lines.

- Stone lines
- Terraces
- Diversion ditches.
- Gabions / porous dams.
- Check dams.

 $1 \times 1 = 1 \text{ mark}$ **c)-** Raised heap of soil reduces surface run-off.

- Grass planted on the heap of soil hold soil firmly and reduces rain drop impact
- Shallow channel trap water and encourage water infiltration.

 $2 \times 1 = 2 \text{ marks}$ **20. a)** A - mouse bird / bird.

B - rat / mouse

 $2 \times 1 = 2 \text{ marks}$ **b)-** lower quantity of grains / feed on grains.

- lower quality of grains.
- open husks and encourage grain rotting.

 $2 \times 1 = 2 \text{ marks}$ **21.-i)** Shade

## ii) to reduce moisture evaporation.

- To reduce impact on raindrop on the young seedling / allow water to pass through to the seedling in small droplets.

## iii) - Over - shading.

- Overwatering

- Over crowding.

 $2 \times \frac{1}{2} = 1 \text{ mark}$ **22. i)** C - marcotting

D - compound layering.

 $\frac{1}{2} \times 2 = 1 \text{ mark}$ 

## ii) If the wood is hard / when the steam cannot bend easily to the ground.

 $1 \times 1 = 1 \text{ mark}$ 

## iii) - Use of cutting

- Grafting / budding.

- Use of storage organic  $2 \times 1 = 2 \text{ marks}$ **23.** Profit and loss account for Degwa's farm as at 31st Dec. 2004.

| Purchases and expenses |               |           | Sales and receipts |               |           |
|------------------------|---------------|-----------|--------------------|---------------|-----------|
| Opening valuation      | 20,000        | 00        | Poultry            | 2,000         | 00        |
| Feed                   | 1,500         | 00        | Cereal             | 8,000         | 00        |
| Seeds                  | 1,000         | 00        | Vegetable          | 200           | 00        |
| Fertilizers            | 800           | 00        | KCC                | 2,000         | 00        |
| Rent                   | 1,200         | 00        | KGGCU              | 3,000         | 00        |
| Juma                   | 700           | 00        | Closing valuation  | 30,000        | 00        |
| B.P Shell              | 5,500         | 00        |                    |               |           |
| Total                  | 30,700        | 00        |                    |               | 00        |
| Profit                 | 14,500        | 00        |                    |               | 00        |
|                        | <u>45,200</u> | <u>00</u> |                    | <u>45,200</u> | <u>00</u> |

**SECTION C****24.**a) Describe the field management practices that should be carried on dry bean production from planting to harvesting (10 marks)

- Plant at onset of rains.
- Plant at a depth of 5 - 10cm
- Plant certified seeds.
- Space at 45 - 60cm × 10 - 15cm
- Use phosphatic fertilizer at a rate of 100-200kg DAP / ha. at planting.

- Plant 2 - 4 seeds per hole / seed rate 50 - 60 kgs /ha.
  - Carry out gapping.
  - Carry out thinning.
  - Provide stakes for climbing varieties.
  - Control pests
  - Control diseases e.g. antracnose, bean rust.
  - uproot mature dry plants.
  - Gather uprooted plants and spread for further drying.  $10 \times 1 = 10 \text{ marks}$
- b) Explain five factors that should be considered when deciding on the depth of planting a seed
- Size of seed - small seeds shallow depth for seed to emerge above the ground.
  - Soil moisture - high soil moisture shallow depth for germination and growth.
  - Type of germination - cotyledons above the ground shallow depth to enable plant to push cotyledon above the ground.
  - Soil type - clay soil shallow depth to have quick emergence of seedling above the ground.
  - Possibility of pest attack : deep planting to prevent attack by pests.  $5 \times 1 = 5$
- c) Characteristics of crops for green manure
- Should be leafy / highly vegetative.
  - Should be able to rot fast.
  - Should be able to fix nitrogen
  - Should be able to grow in less fertile soil.
  - should be able to complete life cycle in a short time.
  - Should be able to grow fast.
  - Should be healthy.  $5 \times 1 = 5$

**25.**

- a) Outline the care and management practices done on Agro-forestry trees.
- Protection.
  - Pruning
  - Training
  - Grafting.
  - Weed control
  - Mulching
  - Watering / irrigation.
  - Control of pests and diseases.  $5 \times 1 = 5$
- b) Benefits of using certified seeds (5 marks)
- They have high germination potential.
  - They are free from pests and diseases /healthy.
  - They give high yields.
  - They are bred true to type.
  - They are free from foreign materials / are pure.
  - They are free from physical damage.  $5 \times 1 = 5$
- c) Safety precaution when using herbicides
- wear protective clothing such as gloves overalls and boots.
  - Avoid inhaling herbicides by not smoking while spraying or spray along the direction of wind.
  - Read manufactures instructions and follow them strictly.
  - Avoid blowing / sucking blocked nozzles.
  - Wash thoroughly immediately after handling the herbicides.
  - Keep the herbicides safely out of reach of children.
  - Do not wash equipment used for herbicides in water sources used by animals or humus to avoid pollution.
  - Carry out proper disposal of empty containers to prevent environmental pollution.
  - Spray when the weather is calm to avoid spray drift to unintended fields / water sources.
  - Avoid chemical spillage to unintended places.
  - Avoid eating / handling food before washing.
  - Equipment used should be washed thoroughly to avoid damage to crops in the subsequent operation.  $10 \times 1 = 10 \text{ marks}$

**26. a)**

- The period the enterprise will take to mature.
- Availability of market for the produce.
- Prevailing climate.

- The size of land available for the enterprise.
- The current government policy relating to enterprise in question.
- Availability of labour according to the requirement of the enterprise in questions.
- Availability of infrastructure to allow good communication.
- Availability of proper security for the enterprise.
- Availability of enough capital / money.
- Availability of inputs.
- Topography of land.
- Suitability of soil to the enterprises.
- Tastes of preferences of a farmer.
- Land tenure system.
- Social-cultural factors.

***1 × 7 = 7 marks***

**b) Function of agricultural marketing.**

- Carrying out advertising of farm products to increase demand.
- Provide finances / capital to carry out agricultural activities.
- Transportation of farm produces to areas of consumption.
- Storage of arm produce after harvest to minimise loss.
- Selling farm produce on behalf of farmers.
- Packing farm produce to reduce storage space and make transportation easier.
- Process farm produce to provided a variety and increase their value and prolong shelf life.
- Grading farm produce to provide uniform standard and cater for various consumer.
- Assembling farm produced from scattered areas of production for bulking and transport.
- Protection of farm produce from damage by use of chemicals or insurance /bearing risks.
- Buying farm produce from producers.
- Gathering, analyzing and interpreting market information to determine appropriate market and price. ***1 × 10 = 10 marks***

**c) Harvesting of sugarcane**

- harvest at correct age 13 - 22 months for first crop. 12 - 18 months for ratoon crop.
- Take sugarcane sample for testing to determine maturity.
- Use machets, cut mature cane at the base /near the ground.
- Cut of the green tops.
- Strip off leaves from the stem / burn the cane before harvesting.
- Deliver the cane to the factory within 48 hours / immediately after cutting.

***3 × 1 = 3***

**MAARA FORM FOUR JOINT EXAMINATION****Kenya Certification of Secondary Education****AGRICULTURE****Paper - 443/2****July/August 2015****Marking Scheme****SECTION A**

1. Ticks that require three hosts to complete their life cycle *1 × ½ = ½ mark*
2. Factors that limit parasite control in Kenya
- Resistance of acaricide / resistant of parasite control.
  - High cost of acaricides / insecticides.
  - Communal rearing practices.
  - Lack of skills and knowledge in the control of external parasites.
  - High mobility of some parasites. *4 × ½ = 2 marks*
3. Diseases controlled by embryo transplant
- Vaginitis.
  - Brucellosis / contagious abortion / bang's disease. *2 × ½ = 1*
  - Vibriosis (Borine genital campylobacteriosis) *1 × ½ = ½*
4. Causal agent of coccidiosis
- Coccidia of Eimeria species. *1 × ½ = ½*
5. Dual purpose breed of sheep
- Romney marsh.
  - Corriedale
  - Hampshire down. *2 × ½ = 1*
6. Reasons of culling a bull used for breeding
- old age
  - chronic diseases
  - weakness of hind legs
  - vacuousness
  - hereditary defects. *4 × ½ = 2*
7. Type of bee hives
- Kenya top bar hive
  - Long stroth hive
  - long hive
  - box hive *4 × ½ = 2*
8. Beef breeds of cattle
- Aberdeen Angus
  - Charolais.
  - Hereford
  - Galloway *4 × ½ = 2 marks*
9. Signs of heat in sow
- Frequent urination.
  - Clear / slimy mucus discharge from the valva.
  - Valva swells and becomes reddish.
  - Tendency for the saw to mount or accept being mounted.
  - Sow responds positively to the riding test / stand when pressure is applied on the back. *½ × 4 = 2 marks*
10. Reasons why raddling is carried out in sheep management
- To identify the ewes that have been served.
  - To identify the ram that has served ewes.
  - To show fertile animals *½ × 2 = 1*
11. Duties of a worker bee.
- To feed drones, queen and brood.
  - To collect nectar, pollen, gum and water.
  - To clear the hive.
  - To make honey and been wax.
  - To guard hive against intruders.
  - To build combs.
  - To seal cracks and crevices in hives with propolis / wax.

- To control temperature. / cool temperature in the hive  $\frac{1}{2} \times 6 = 3$
- 12. Viral diseases**
- Rinderpest.
  - Rabies
  - Rift valley fever
  - New castle.
  - Marek's disease / fowl paralysis.
  - Gumboro.
  - Swine fever.  $\frac{1}{2} \times 6 = 3$
- 13. Factors considered when grading eggs for marketing**
- Size / weight of the eggs.
  - Colour of the eggs.
  - Cleanliness.
  - Shell qualities.
  - Shape of the egg.  $\frac{1}{2} \times 4 = 2$
- 14. Functions of minerals in an animal diet**
- Maintaining electrolyte balance in body fluid e.g. Sodium and potassium
  - Building strong bones and teeth e.g. calcium and phosphorous.
  - Nerve transmission e.g. calcium, sodium and potassium.
  - Regulating muscle contraction e.g. calcium helps in the generation of action potential of skeletal muscles.
  - Food metabolism e.g. phosphorus and sulphur are components of some proteins.
  - proper functioning of hormones e.g. iodine helps thyroxine, function.
  - Haemoglobin formation e.g. Iron.
  - Co-enzyme in body metabolisms.
  - Clotting of blood e.g. calcium.
  - Prevent diseases such as goitre (iodine) anaemia (iron), rickets (phosphate and calcium).
  - Body repair e.g. Zinc helps to heal wounds.  $\frac{1}{2} \times 6 = 3 \text{ marks}$
- 15.**
- a) Cross breeding - refers to mating of different breeds.
  - b) Upgrading - refers to mating a superior male with an inferior female so as to improve its offspring.  $1 \times 2 = 2$
- 16. Qualities of creep feed**
- It is palatable.
  - It is highly digestible.
  - It is attractive to piglets.
  - It is nutritious.  $\frac{1}{2} \times 2 = 1$
- 17. Reason for using concrete floors for dairy shed**
- they are easy to clean.
  - They are long lasting.
  - They do not encourage foot rot.
  - They aid in controlling parasites.
  - They help to prevent water logging.
  - They allow easy drainage of urine.  $\frac{1}{2} \times 4 = 2$
- SECTION B**
- 18. Parts**
- A - germinal disc
  - B - chalazae
  - C - outer thin albumen
  - D - thick albumen  $4 \times 1 = 4 \text{ marks}$
- ii) Functions of the parts labelled B
- It transfers heat to the developing embryo.
  - It holds yolk in position.  $2 \times 1 = 2 \text{ marks}$
- 19. a) Tape worm  $1 \times 1 = 1$**
- b) Organ where parasite is found
    - Small intestine
  - c) Intermediate host where parasite is found.
    - Pig
    - Cattle  $1 \times 1 = 1$

d) Symptoms of attack

- Staring / rough coat.
- Oedematous / swelling under the jaw.
- Presence of parasite segments / proglotticls in faeces.
- Excessive / ravenous appetite.
- Constipation
- Obstruction /blockage of intestines
- Anaemia
- Pot belly

 **$1 \times 4 = 4$  marks**e) Methods of controlling parasites

- Maintenance of proper hygiene.
- Practising rotational grazing to starve the larvae
- Regular deworming of animals
- Proper sewage disposal / proper disposal of human waste.
- Eat properly cooked meat.

 **$1 \times 2 = 2$** **20.**

## a) Identity of tools.

G - Garden trowel - reject trowel

H - Trocar and canula.

J - Masons Trowel - reject trowel

K - secateurs.

 **$4 \times \frac{1}{2} = 2$  marks**b) **Uses of**

H - Used for removing gases in case of bloat occurrence in an animal.

K - used for pruning soft branches e.g. in coffee bushes.

 **$\frac{1}{2} \times 2 = 1$** c) Reasons for using farm tools to perform various farm operations

- To increase efficiency on the farm operations.
- To make farm operations easier.
- For safety of the user.
- To enhance production.

 **$2 \times 1 = 2$** **SECTION C****21.**a) Factors to consider when selecting construction materials

- Availability of materials.
- Cost of materials.
- Capital availability
- Whether the structure is temporary or permanent.
- Suitability of each type of materials to the prevail weather conditions.
- Durability of the materials.
- Workability of the materials with the tools.

 **$5 \times 1 = 5$  mark**b) Importance of fences in the farm

- The perimeter fence which is constructed along the boundary demarcates the farm land from that of neighbours.
- Fences keep off wild animals and other intruders from outside the farm.
- They are used to separate crop field from the pastures facilitating mixed farming.
- They are used to divide pastures into paddocks facilitating controlled grazing systems such as rotational grazing.
- Controls the movement of animals and people preventing the formation of unnecessary path in the farm.
- Helps to control spread of parasites and diseases by keeping off wild animals from the farm.
- Fences help to isolate sick the sick animals from the rest of the herd to prevent diseases spread.
- They help the farmer to control breeding by rearing different animals in different paddocks.
- They provide security to the homestead and farm animals.

 **$10 \times 1 = 10$** 

## c) Artificial rearing of calves.

- It is easy to keep accurate records of milk yields.
- It is easy to regulate the amount of milk taken by calf.
- Cows continue to produce milk even in the absence of their calves.
- It is easy to maintain high standards of sanitation.
- There is likelihood of the farmer selling more milk hence maximizing profits.

 **$5 \times 1 = 5$  marks****22.** Factors that should be taken into account to ensure proper cultivation using Ox and ox-drawn plough.

- The oxen should be kept healthy.
- The oxen should be properly feed.

- The oxen should be trained properly.
- Avoid overloading the oxen
- Ensure proper handling of the plough.
- Avoid overworking or bealing the animals.
- Use skilled operators.
- Harness the oxen properly to avoid injury.
- Replace the broken parts in the plough.
- Ensure the nuts and bolts are tightened.
- Ensure open and operators have adequate rest in between operations.
- Operators should be well fed.  $8 \times 1 = 8 \text{ marks}$

**b) Operational differences between a disc and a mouldboard plough.**

**Disc plough**

It can be used on a field with obstacles because it rolls over - them

It can be used in dry and hard soils

It is not easily broken by obstacles because it rides over them

It leaves a rough field since it doesn't invert the furrow slices completely

It requires more secondary cultivation because of field roughness

It cuts at varying depths because when it comes across obstacles it rides over them

It requires less tractor power when in operation

It has lower maintenance cost

**Mouldboard plough**

It can be used on a field with obstacles because it is rigid and slides along during operation

- It cannot manage in dry and hard soils

- It may break easily because of its rigidity when working

- It leaves a clean field since it inverts the furrow slices completely

- It requires fewer secondary operation

- It operates at uniform depth because the share follows the same depth in the soil.

- It requires more tractor power when operating

- It has higher maintenance cost.

**23. a) Life cycle of a two host tick**

- Eggs on the ground hatch into larvae - and climb on the 1st host.
- Larvae feed on blood of the first host and become engorged.
- Larvae moult into nymph. Nymphs feed on the same host.
- Engorged nymphs drop to the ground and moult into adults.
- The adult climb on second host where they feed and mate.
- Engorged females drop to the ground to lay eggs.

$1 \times 8 = 8 \text{ marks}$

**b) Newcastle disease.**

**i) Mode of transmission.**

- Contact with contaminated materials and food.
- Infected birds sneeze and cough hair droplets.
- Eggs from infected birds.

$1 \times 2 = 2$

**ii) Symptoms**

- Difficulty in breathing / respiratory problems.
- Dullness/ birds stand with eyes closed.
- Loss of appetite / anorexia.
- Nasal discharge.
- Sneezing.
- Paralysis / staggering motion.
- Drooping of wings.
- Greenish diarrhoea.
- Drop in production of eggs.
- Production of soft shelled eggs.
- Bending of neck / Torticollis.

$1 \times 5 = 5 \text{ marks}$

**iii) Control measures**

- Vaccinate birds at regular intervals.
- Isolate infected birds / destroy infected birds.
- Disinfect the poultry house before bringing in new stock.
- Impose quarantine on the farm.
- Obtain chicks from reliable sources.

$1 \times 5 = 5 \text{ marks}$

**BELOW ARE REVISION EXERCISES****WESTLANDS JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

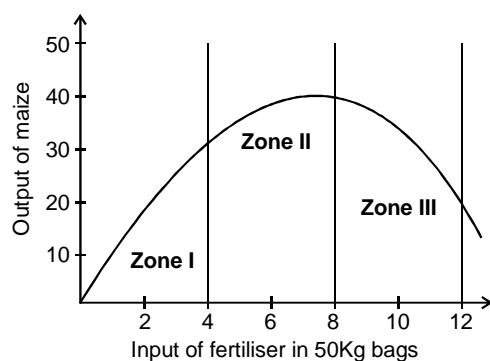
Paper - 443/1

**July/August 2015****Time:** 2 hours**SECTION A (30 marks)**Answer ALL questions in this section on the spaces provided.

1. State any **four** farming practices that make Agriculture a science. (2 marks)
2. State **three** positive effects of wind in Agricultural production. (1½ marks)
3. Give **four** reasons why green manure is not commonly used by farmers. (2 marks)
4. List **four** tree harvesting methods in Agroforestry. (2 marks)
5. Distinguish between land settlement and resettlement. (1 mark)
6. Give the importance of the following agricultural practices.
  - i) Pricking out. (½ mark)
  - ii) Hardening off. (½ mark)
7. Outline three distinctive features of a monopolistic competition in marketing. (1½ marks)
8. Name four examples of maize diseases. (2 marks)
9. Name **three** vegetative parts used to propagate pineapples. (1½ marks)
10. Give **five** reasons why pruning is essential in coffee production. (2½ marks)
11. Give **four** agencies that are involved in the marketing of agricultural commodities. (2 marks)
12. Outline any **four** functions of trees in soil conservation. (2 marks)
13. List **four** details contained in the muster roll in farm records. (2 marks)
14. List **four** factors which should be considered in determining the depth of planting. (2 marks)
15. Give three categories under which pastures are classified. (1½ marks)
16. What is a pest in crop production. (1 mark)
17. Why is the bulb exposed shortly before harvesting in onion production. (½ mark)
18. Give any two types of elasticity of demand. (1 marks)
19. State two conditions that may lead to land fragmentation. (1 mark)

**SECTION B (20 marks)**Answer ALL the questions.

20. a) State the law of Diminishing returns. (1 marks)



- b) i) Which zone is referred to as the rational zone? (1 mark)
- ii) Explain what is happening in the three zones of a production functions curve.
  - Zone I (1 mark)
  - Zone II (1 mark)
  - Zone II (1 mark)



21. The diagram below shows weeds labelled A and B.



- Identify the weeds labelled A and B.
  - Classify the weeds above according to their morphology. (2 marks)
  - Why is it difficult to control the weed labelled A
22. The diagram below shows a field crop pest. Study it and answer the questions that follow.



- Identify the crop pest. (1 mark)
  - Name any four crops attacked by the pests. (2 marks)
  - Outline two methods that can be used to control the pest. (2 marks)
23. Describe the procedure of transplanting a tree seedling from a polythene sleeve. (5 marks)

### SECTION C

Answer any TWO questions.

24. Describe the production of tomatoes under the following subheadings.
- Nursery management. (5 marks)
  - Land preparations. (5 marks)
  - Transplanting. (5 marks)
  - Harvesting and marketing (5 marks)
25. a) What is an invoice? (1 mark)
- State five information contained in an invoice. (5 marks)
  - Use the following information to prepare a profit and loss account for Kaimenyi farm for the year ending December 2014.

His purchases and expense were as follows.

|                                |           |
|--------------------------------|-----------|
| Goats                          | 4,000/=   |
| Poultry                        | 15,000/=  |
| Dairy meal                     | 25,000/=  |
| Pasture seeds                  | 50,000/=  |
| Transportation of farm produce | 15,000/=  |
| Casual workers                 | 12,000/=  |
| Ox-plough                      | 10,000/=  |
| Opening valuation              | 150,000/= |

His sales and receipts were:

|                   |           |
|-------------------|-----------|
| Mohair            | 75,000/=  |
| Rabbits           | 36,000/=  |
| Dairy cow         | 70,000/=  |
| Wheat             | 100,000/= |
| Cabbages          | 20,000/=  |
| Eggs to hotel     | 15,000/=  |
| Closing valuation | 200,000/= |

- Did Mr. Kaimenyi make a profit in the year 2014. (1 mark)
  - How much was the profit. (1 mark)
26. a) State the importance of water to plants. (4 marks)
- What is the importance of treating water before use. (4 marks)
  - Describe the process of water treatment using a chemical treatment plant. (12 marks)

**WESTLANDS JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

Paper - 443/2

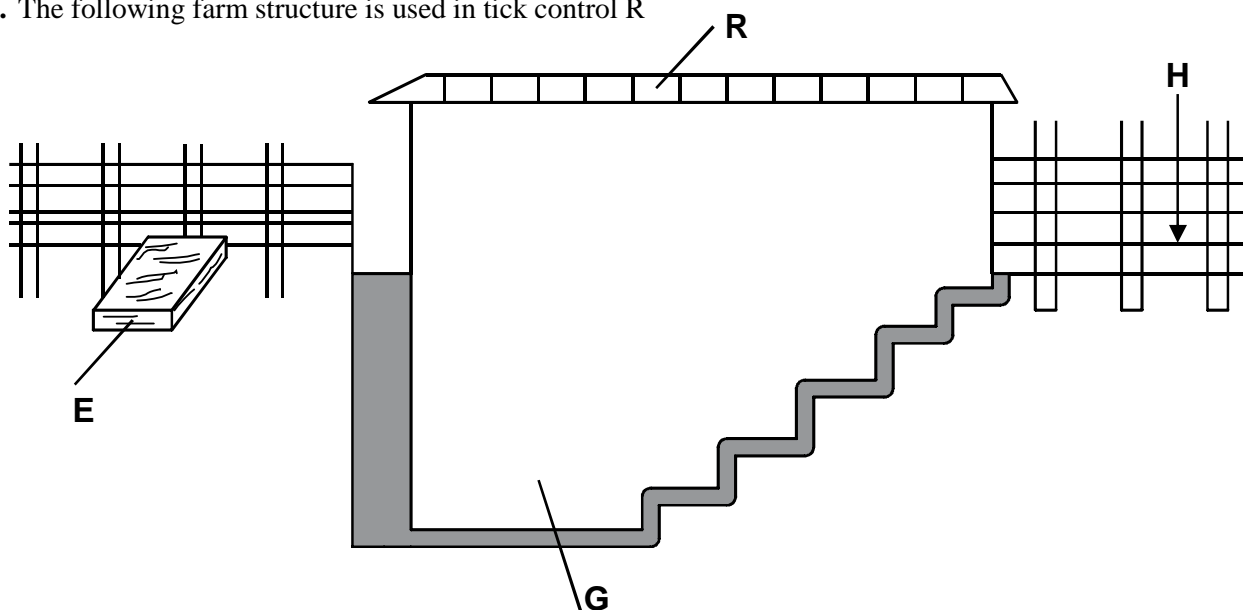
**July/August 2015****Time: 2 hours****SECTION A (30 marks)**

Answer ALL the questions in this section in the spaces provided.

1. Define the term epistasis as used in livestock production. (1 mark)
2. Name the other tool used together with the following tools during their operations. (2 marks)
  - i) Cannular
  - ii) Brace
  - iii) Elastrator.
  - iv) Wood chisel
3. Give two heavy breeds of poultry. (1 mark)
4. List down three types of lubrication systems used in tractors for efficiency production. (1½ marks)
5. State two examples of one host tick. (1 mark)
6. Name two livestock diseases controlled through artificial insemination. (1 mark)
7. State two functions of crop in poultry. (1 mark)
8. Give two functions of drones in a bee colony. (1 mark)
9. State five parts of a zero grazing units. (2½ marks)
10. Name two hormones responsible for milk secretion and milk let down. (1 mark)
11. List four predisposing factors of mastitis disease in cattle. (2 marks)
12. Differentiate between cropping and harvesting as used in fish farming. (1 mark)
13. Explain the meaning of the following terms in livestock management.
  - i) Drift lambing. (1 mark)
  - ii) Pen lambing. (1 mark)
14. List four components of power transmission system in a tractor. (2 marks)
15. Mention **four** reasons for choosing animal power instead of tractor power on the farm. (2 marks)
16. State any **four** farm structures used to control livestock parasites and diseases. (2 marks)
17. Define a notifiable disease and give two examples. (2 marks)
18. Distinguish between out crossing and cross breeding as used in livestock production. (2 marks)
19. State four signs which indicate that the sow is about to farrow. (2 marks)

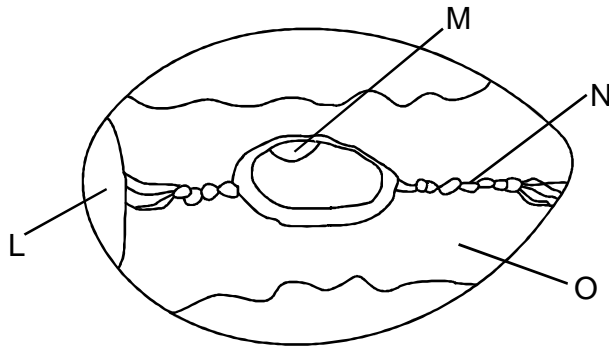
**SECTION B**

20. The following farm structure is used in tick control R



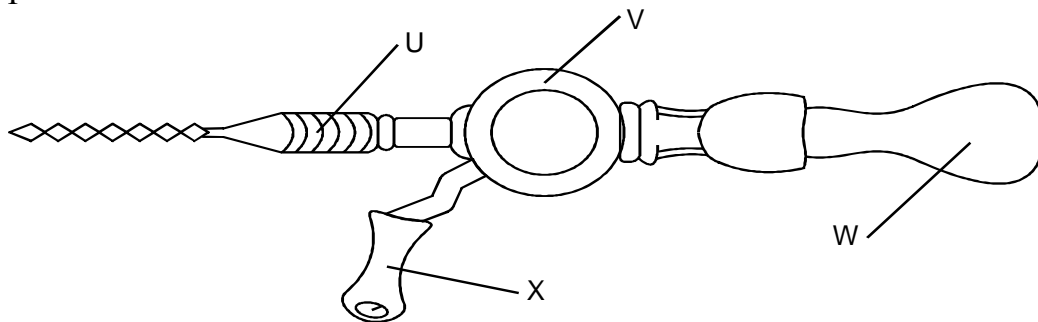
- a) Identify the structure. (1 mark)
- b) Name the parts labelled E, R, G and H. (2 marks)
- c) What is the use of the parts labelled E and R (2 Marks)

21. Study the diagram below and answer the questions that follow.



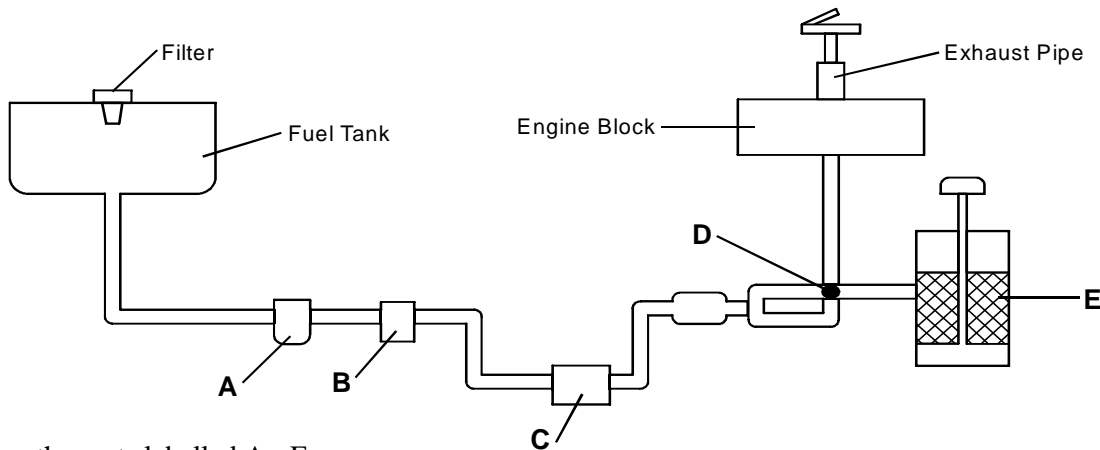
- a) Name the parts labelled L - O. (2 marks)
- b) Outline four characteristics of eggs for incubation. (2 marks)
- c) Give one reason for egg candling. (1 mark)

22. Study the diagram of a workshop tool illustrated below and answer the questions that follow.  
Tool Y



- a) Identify the tool labelled Y (1 mark)
- b) Name the parts labelled U - X (2 marks)
- c) State one use of the above tool. (½ mark)
- d) State three repair and maintenance practices that should be carried out on the tool Y in (a) above. (1½ marks)

23. Study the diagram below of the petrol fuel system and answer the questions that follow.



- i) Name the parts labelled A - E. (5 marks)

**SECTION C**

Answer any TWO questions.

- 24. Describe the management of a calf from birth to weaning using bucket feeding. (20 marks)
- 25. a) State six effects of parasites in livestock. (6 marks)
- b) Describe the lifecycle of Taenia solium species of tapeworm. (10 marks)
- c) State four control measures of tapeworms (4 marks)
- 26. a) State and explain five factors that influence the siting of farm structures. (10 marks)
- b) State five operational differences between a disc and mouldboard plough. (10 marks)

**NYERI COUNTY FORM FOUR JOINT ASSESSMENT**

Kenya Certificate of Secondary Education

**AGRICULTURE**

Paper - 443/1

**July / August 2015**

**Time:** 2 hours

**SECTION A (30 marks)**

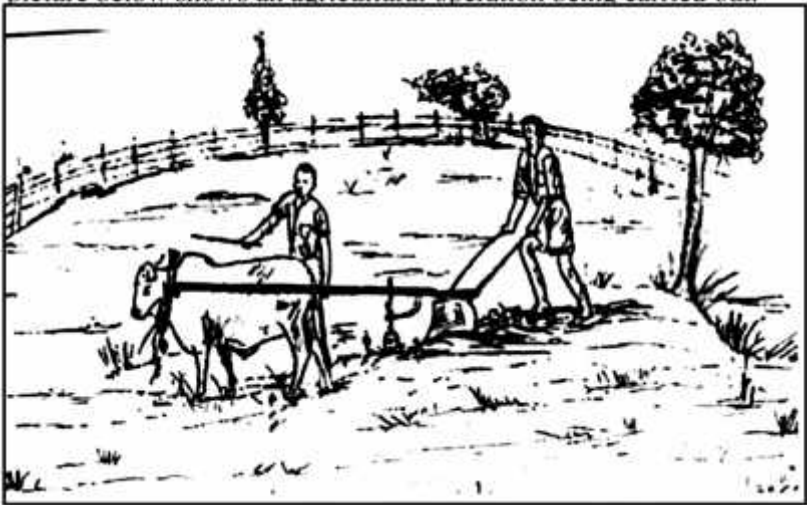
Answer ALL questions in this section on the spaces provided.

- 1. State four advantages of ranching over pastoral nomadism. (2 marks)
- 2. Give four materials that should be avoided in preparation of compost manure. (2 marks)
- 3. State four reasons why a dairy farmer should maintain breeding records. (2 marks)
- 4. State two factors that determine the method used to harvest a crop. (1 mark)
- 5. a) State two advantages of individual land tenure systems. (1 mark)  
b) List four reasons that may necessitate settlement and resettlement. (2 marks)
- 6. a) Name three aspects of light that influence crop production. (1½ marks)  
b) List five constituents of soil (2½ marks)
- 7. List four ways in which pH affect crop production. (2 marks)
- 8. a) differentiate between under sowing and over sowing as used in pasture crop establishment. (2 marks)  
b) List four effects of weed on pastures. (2 marks)
- 9. a) Name two types of statements used in farm accounting. (1 mark)  
b) State two uses of inventory in farm accounts. (1 mark)
- 10. State four pieces of information contained in a profit and loss account. (2 marks)
- 11. a) List four sources of tractor hire services to farmers. (2 marks)  
b) Name four sources of agriculture credit in Kenya. (2 marks)
- 12. List four importance's of agroforestry. (2 marks)

**SECTION B (20 marks)**

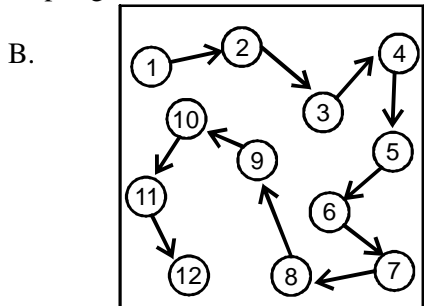
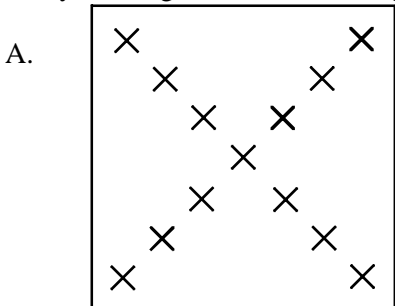
Answer ALL the questions from this section

- 13. The picture below shows an agricultural operation being carried out.



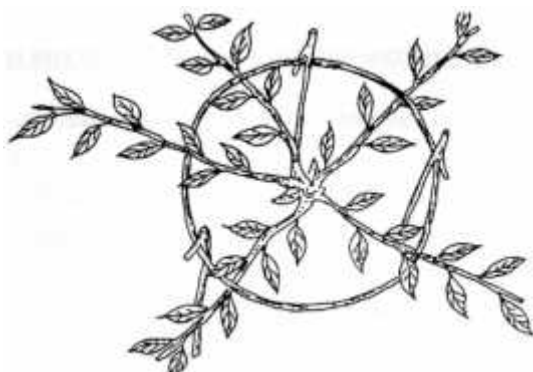
- i) Identify the activity. (1 mark)
- ii) Give three conditions under which the activity is carried using the above method instead of tractor drawn implements. (3 marks)

- 14. Study the diagram below showing soil sampling methods.



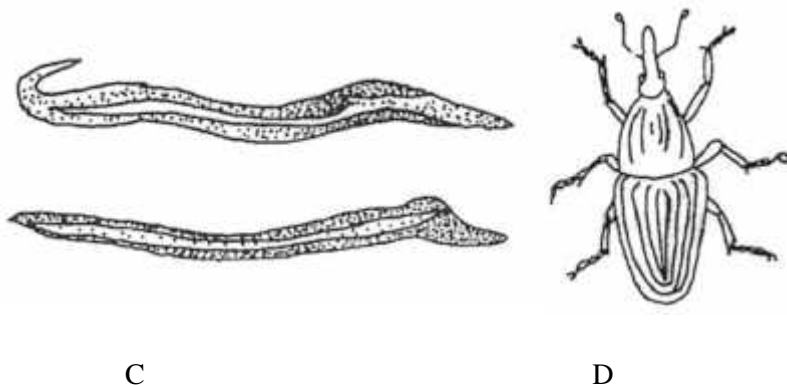
- i) Identify the soil sampling methods illustrated. (1 mark)  
 ii) State the importance of soil sampling. (1 mark)  
 iii) List three precautions taken when collecting a representative soil sample from the field for testing. (3 marks)

15. The diagram below shows a method of bringing tea into bearing. Study it and use it to answer the questions that follow.



- a) Identify the method in the diagram shown above. (1 mark)  
 b) Name the parts labelled M and N in the diagram. (2 marks)  
 c) Explain the importance of the above practice in crop production. (2 marks)

16. The diagrams below shows two types of crop pests, C and D



- i) Identify and categories the pests based on their habitat. (4 marks)  
 ii) State two control measures for the pest C, named above. (2 marks)

**SECTION C (40 marks)**

Answer any TWO questions from this section in the spaces provided after question 19

17. a) Outline six safety precautions that should be observed in order to protect the environment when using herbicides. (6 marks)  
 b) Describe planting of carrots in the field. (6 marks)  
 c) Explain the role of agricultural co-operatives in Kenya. (8 marks)
18. a) Describe four roles played by living organisms in the process of soil formation. (5 marks)  
 b) Explain four ways of preparing planting materials. (8 marks)  
 c) i) Outline four precautions observed while harvesting cotton. (4 marks)  
 ii) Describe seedbed preparation in beans. (3 marks)
19. a) Describe four agricultural practices that help to control water pollution. (4 marks)  
 b) Explain four management practices carried out on a tree seedling after transplanting. (8 marks)  
 c) Describe four methods of water harvesting in the farm (8 marks)

**NYERI COUNTY FORM FOUR JOINT ASSESSMENT**

Kenya Certificate of Secondary Education

**AGRICULTURE**

Paper - 443/2

**July / August 2015****Time:** 2 hours**SECTION A (30 marks)**

Answer ALL questions in this section on the spaces provided.

1. Write down four physical signs of ill health in livestock. (2 marks)
2. State two physical characteristics of Duroc Jersey pig breed. (1 mark)
3. Give a functional difference between a hand drill and a bit brace drill. (1 mark)
4. List four general methods of disease control. (2 marks)
5. Study the table below and fill in appropriately in the blank spaces. (4 marks)

| Parasite       | Disease transmitted | Casual organism | Animals affected |
|----------------|---------------------|-----------------|------------------|
| Brown ear tick |                     |                 |                  |
| Tse tse fly    |                     |                 |                  |
| Liverfluke     |                     |                 |                  |

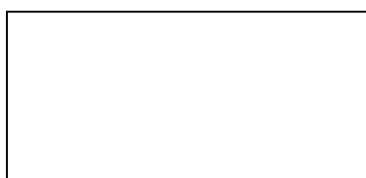
6. State FOUR predisposing factors of pneumonia in livestock. (2 marks)
7. Give four management practices carried out on an incubator. (2 marks)
8. State four harmful effects of lice in birds. (2 marks)
9. Study the table below and fill in appropriately. (2 marks)

| Minerals / Vitamin | Deficiency conditions / symptoms |
|--------------------|----------------------------------|
| Calcium            |                                  |
| Magnesium          |                                  |
| Vitamin A          |                                  |
| Vitamin B2         |                                  |

10. State two permanent identification methods in goats. (1 mark)
11. Define the following terminologies as used in livestock nutrition. (1 mark)
  - i) Digestibility. (1 mark)
  - ii) Calorific value. (1 mark)
12. list four reasons for culling a camel. (2 marks)
13. Name two factors that hinder use of water power in the farm. (1 mark)
14. Give two factors of a good laying nest in poultry production that helps control egg eating. (1 mark)
15. State four reasons for maintaining livestock in good health. (2 marks)
16. State four ways through which the tractor battery is maintained in a good condition. (2marks)
17. List two functions of an egg shell. (1 mark)

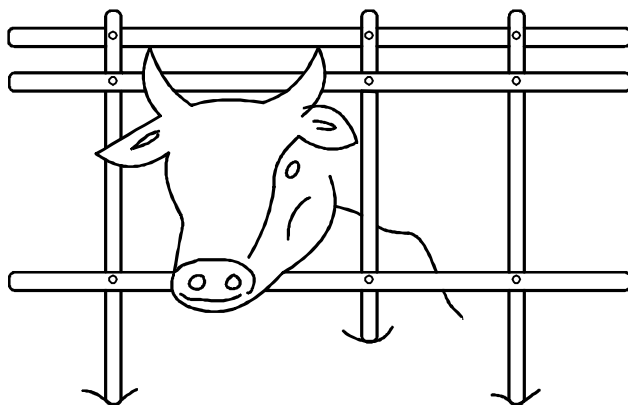
**SECTION B (20 marks)****Answer ALL the questions in the spaces provided.**

18. The illustration below shows a physical feature observed in a given cattle breed. Study the diagram and answer the questions that follow.

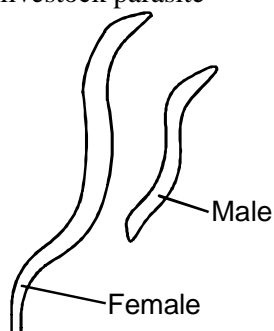


- i) Name any four exotic breeds with the above feature. (2 marks)
- ii) Describe two other ideal physical characteristics of the above breeds of cattle. (2 marks)

19. The diagram below shows a part of a crush. Study it and answer the questions that follow.



- i) Identify the part of the crush. (1 mark)
  - ii) State two activities carried out with the assistance of the part identified above. (2 marks)
  - iii) Describe two maintenance practices carried out on the structure. (2 marks)
20. The following is an internal livestock parasite



- Give four physical symptoms observed on an animal infested by the parasite (4 marks)
21. Describe the preparatory activities on fish before preservation. (3 marks)
  22. List down the steps followed when training a calf to bucket feed. (4 marks)

### SECTION C (40 marks)

**Answer any TWO questions from this section in the spaces provided after question 25**

23. a) Describe fowl pox disease under the following sub-headings.
  - i) Causal organism (1 mark)
  - ii) Signs of infection. (6 marks)
  - iii) Control and treatment measures. (3 marks)
- b) Explain any four tools used in the construction of a stone or brick wall. (4 marks)
- c) Outline six challenges faced by farmers during marketing of milk in Kenya (6 marks)
24. a) Describe the process of egg formation in birds reproduction system. (8 marks)
- b) State four factors a farmer may consider when composing a livestock ration. (4 marks)
- c) i) State three importance of storage in the farm. (3 marks)
- ii) Describe the ideal features of a farm store. (5 marks)
25. a) Describe ideal practices that ensures effective brooder management. (12 marks)
- b) i) Describe any two points of attachment through which engine power is made available to a drawn implement. (4 marks)
- ii) Give four limitations of animal power (4 marks)

**KAJIADO COUNTY JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

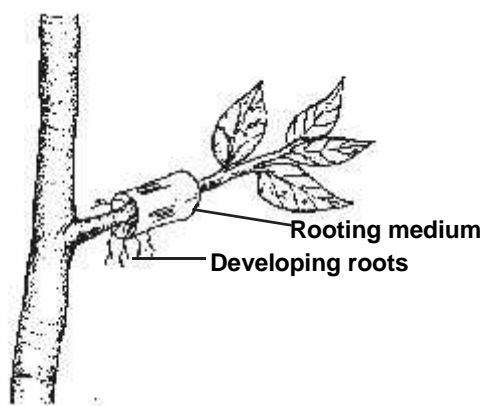
Paper - 443/1

**July/August 2015****Time: 2 hours****SECTION A (30 marks)**Answer ALL questions in this section on the spaces provided.

1. Give FOUR agricultural practices that show agriculture is an art. (2 marks)
2. State TWO ways in which a farmer is positively affected by liberalization of the Kenyan market. (1 mark)
3. Give TWO environmental factors, which are controlled by use of a green house. (1 mark)
4. Mention FOUR benefits of a deep soil profile to crop production. (2 marks)
5. Give TWO ways in which scarcity affects agricultural production. (2 marks)
6. Give three reasons why the Kenya government introduced settlement and resettlement reforms. (1½ marks)
7. Name FOUR sites suitable for agroforestry trees. (2 marks)
8. Give THREE reasons for cutting back in pyrethrum. (1½ marks)
9. Give one reasons why the following treatments are done on seeds before planting.
  - i) Seed dressing. (½ mark)
  - ii) Seed inoculation (½ mark)
10. State THREE factors that influence the success of the union in budding. (1½ marks)
11. Name FOUR crops that are propagated using grafting. (2 marks)
12. Give TWO reasons why phosphatic fertilizers, benefit subsequent crops on 2nd and 3rd year after application. (1 mark)
13. Differentiate between a nursery bed and a seedling bed. (1 mark)
14. State THREE causes of handpans in a crop field. (1½ marks)
15. State THREE effects of siltation in dams. (1½ marks)
16. Outline FIVE roles of a farm manager. (2½ marks)
17. Give FOUR factors that determine the nutrient content of hay. (2½ marks)
18. Name FOUR types of terraces. (2 marks)
19. Outline FOUR characteristics of crops used for green manuring. (2 marks)

**SECTION B (20 marks)**Answer all questions.

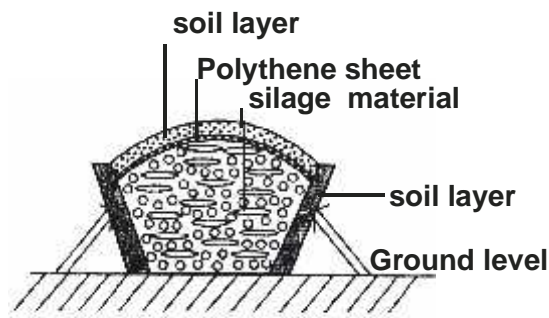
20. Study the illustration below and answer the questions that follow.



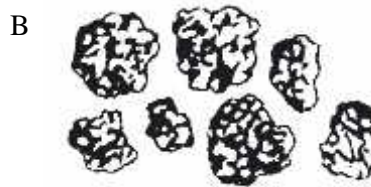
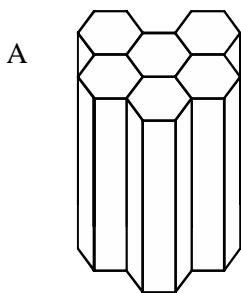
- i) Identify the method of propagation above. (1 mark)
- ii) State THREE methods used in layering (3 marks)
- iii) Name TWO materials that are used in the method of propagation illustrated by the diagram above (2 marks)
- iv) Outline TWO importance of the method of propagation identified in (i) above (2 marks)
- v) State TWO conditions under which the above propagation method illustrated by the diagram is recommended. (2 marks)



21. Below is a diagram of a clamp silo. Study it carefully and then answer the following questions.



- State the function of the soil layer at the sides. (1 mark)
  - Give ONE reason for the sloping of the silage material at the top. (1 mark)
  - State TWO ways of controlling high temperature on the silo during the ensiling process. (2 marks)
22. Study the following types of soil structures and answer the questions that follow.



- Identify the type of soil structures labelled. A and B. (2 marks)
  - Which type of the two soil structures illustrated by the diagrams is best suited for farming. (1 mark)
  - Give THREE reasons for your answer in (b) above. (3 marks)
23. The diagram below represent some weeds labelled G & H. Study them and answer the questions that follow.



- Identify the weeds. G and H (2 marks)
- Give a specific harmful effect of each weed. (2 marks)

### **SECTION C**

Answer any TWO questions in this section in the spaces provided at the end of the section

- Explain FIVE environmental factors that affect the effectiveness of a herbicide. (10 marks)
  - Outline measures which can minimise water pollution on a farm. (6 marks)
  - Describe the role of potassium in crop nutrition. (4 marks)
- Explain ten factors influencing supply of a commodity in a market. (10 marks)
  - Explain the preparation of bean seeds for planting. (10 marks)
- Outline the steps that farmers should follow when planning a farm business. (7 marks)
  - Explain the factors determining the depth of planting. (8 marks)
  - Outline FIVE contributions of agriculture to the national development. (5 marks)

**KAJIADO COUNTY JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

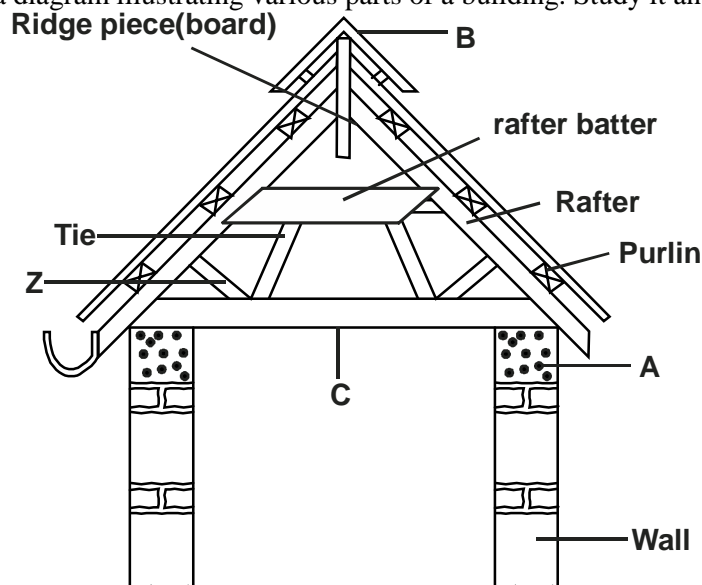
Paper - 443/2

**July/August 2015****Time: 2 hours****SECTION A (30 marks)**Answer ALL the questions in this section in the spaces provided.

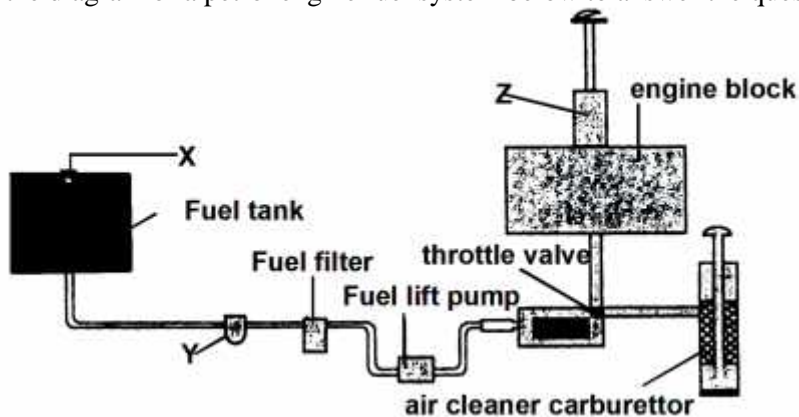
1. Name TWO attachment methods used in attaching implements onto a tractor. (1 mark)
2. Give FOUR reasons why camels are suited to living in arid areas. (2 marks)
3. Outline FOUR factors that determine nutritional requirement of cattle. (2 marks)
4. Give the function of each of the following parts of the reproductive system of a hen in egg formation.
  - a) The funnel (infundibulum)
  - b) Uterus (shell gland)
5. Outline FOUR functions of a gearbox in a tractor. (2 marks)
6. Give FOUR deficiency symptoms of calcium in a lactating cow. (2 marks)
7. State FOUR advantages of animal power. (2 marks)
8. List TWO methods of castration in beef cattle. (1 mark)
9. Name THREE zoonotic diseases in livestock. (1½ marks)
10. State FOUR construction features in a fish pond. (2 marks)
11. Give the origin of each of the following livestock breeds. (1 mark)
  - a) Toggenburg
  - b) Large white
12. List TWO farm structures used in the control of external parasites in livestock. (1 mark)
13. Mention THREE tools used to ensure that the building blocks are correctly laid during construction. (1½ marks)
14. State THREE desirable characteristics of Boran cattle. (1½ marks)
15. List down FIVE signs of farrowing in livestock. (2½ marks)
16. Give THREE reasons for feeding bees. (1½ marks)
17. Give the function of each of the following farm tools and equipment. (2½ marks)
  - a) Teeth clipper.
  - b) Sledge hammer.
  - c) Riveting machine
  - d) Pruning hook .
  - e) Wood float
18. Name FOUR categories of livestock diseases based on their causal agent. (2 marks)

**SECTION B (20 marks)**Answer ALL questions in the spaces provided

19. Below is a diagram illustrating various parts of a building. Study it and use it to answer the questions below.

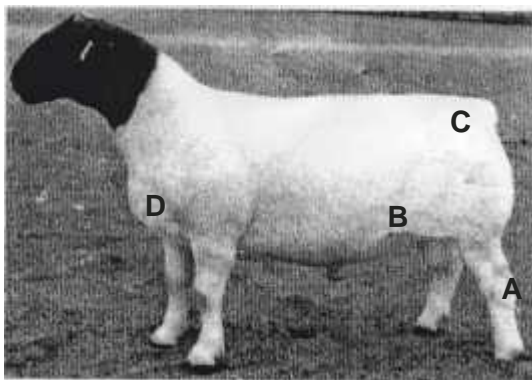


- a) Name the parts labelled A, B, C (1½ marks)  
 b) Give one function of part Z (1 mark)  
 c) State TWO types of materials used to make the truss above. (2 marks)  
 d) Give TWO factors that would be considered on choice of materials to construct a roof. (2 marks)
20. Use the diagram of a petrol engine fuel system below to answer the questions that follow.



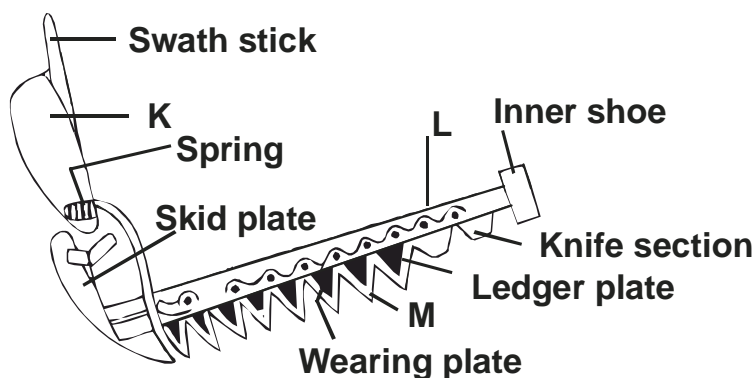
- a) Name the parts labelled X, Y and Z. (3 marks)  
 b) Give the maintenance practice of the following parts. (2 marks)  
 i) Fuel tank cap  
 ii) The carburettor

21. Below is a diagram of a sheep



- a) Identify the sheep breed. (2 marks)  
 b) Name the part labelled A, B, C and D. (2 marks)  
 c) On the diagram above, mark with letters E, F and G where the following practices are done.  
 E - Raddling  
 F - Tagging  
 G - Taking body temperature (1½ marks)

22. Below is a diagram of a farm implement. Study it and answer the questions that follow.



- a) Identify the implement. (½ mark)

- 
- b) Name the parts labelled K, L, M (1½ marks)  
c) Give one use of the implement on the farm. (1 mark)  
d) Explain any two maintenance practices carried out on the implement. (2 marks)

**SECTION C (40 marks)**

Answer only TWO questions from this section

23. a) Outline the symptoms of Tapeworm (*Taenia* spp) attack in livestock. (10 marks)  
b) Describe five appropriate handling practices during routine management in livestock. (10 marks)
24. a) Explain four cultural uses of livestock (8 marks)  
b) Outline six advantages of the four stroke cycle engine. (5 marks)  
c) Describe preparation of a sow, one week before farrowing. (7 marks)
25. a) Discuss the four rules to be observed during milking in dairy cows. (8 marks)  
b) Describe the process of digestion in following parts in poultry digestive system.  
i) Crop (2 marks)  
ii) Gizzard (2 marks)  
iii) Caecum (2 marks)  
c) Outline any six preventive measures in livestock disease control. (6 marks)

**UGENYA UGUNJA JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

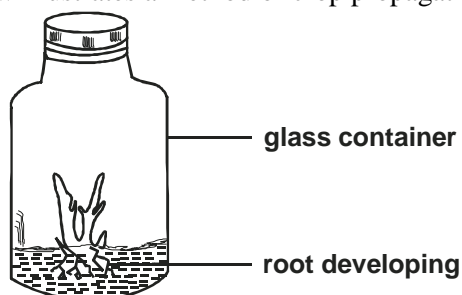
Paper - 443/1

**July / August 2015****Time: 2 hours****SECTION A (30 marks)**Answer ALL questions in this section on the spaces provided.

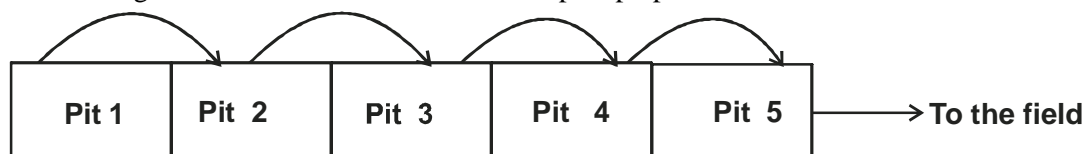
1. Name two factors which influence soil colour. (1 mark)
2. Give four uses of labour records. (2 marks)
3. State four farming practices done to reduce water stress in crop production. (2 marks)
4. Give four reasons why agricultural produce should be processed. (2 marks)
5. State two factors that may induce forking in carrots. (1 mark)
6. Give four government policies that influence agricultural production in Kenya. (2 marks)
7. State four problems encountered by farmers when storing their produce. (2 marks)
8. Give four examples of joint products in livestock production. (2 marks)
9. State four methods of breaking seed dormancy. (2 marks)
10. Give four precautions that should be taken when harvesting cereal crops. (2 marks)
11. List two sites of agroforestry trees and shrubs. (1 mark)
12. State four methods of controlling stalkborer pest. (2 marks)
13. List two qualities that enable sorghum to be drought resistant. (1 mark)
14. State four reasons for top-dressing pastures. (2 marks)
15. Give four reasons why bush burning is discouraged during land preparation. (2 marks)
16. State four aims of land settlement programmes in Kenya. (2 marks)
17. List four problems facing agriculture in Kenya. (2 marks)

**SECTION B (20 marks)**Answer ALL questions in this section on the spaces provided.

18. The diagram below illustrates a method of crop propagation.



- a) Identify the method of propagation. (1 mark)
  - b) Name one crop propagated through the method. (1 mark)
  - c) State three advantages of the method above. (3 marks)
19. The diagram below shows a method of compost preparation.

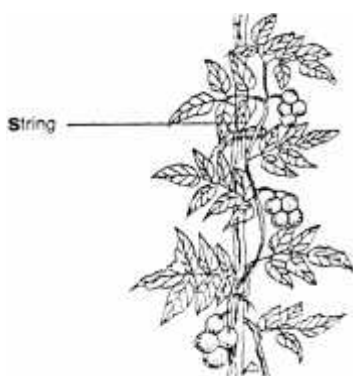


- a) Identify the method. (1 mark)
- b) State two characteristics of a good site for preparing compost manure. (2 marks)
- c) State two factors that determine time the manure would be ready for use in the field. (2 marks)

20. The illustration below shows a financial document. Study it and answer the questions that follow.

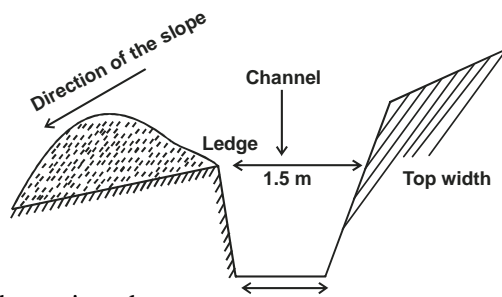
|   |            |                            |                |            |
|---|------------|----------------------------|----------------|------------|
| No. 2009  |            | DATE: 01/08/2013           |                |            |
| M/s OJWANDO FARMERS STORE                               |            |                            |                |            |
| DR. . . ODENDO FARMERS CO-OPERATION UNION               |            |                            |                |            |
| BOX 10, ASEGO   |            |                            |                |            |
|   | Particular | Quantity                   | Price per unit | Amount     |
|   | Urea       | 50 bags                    | 2,000.00       | 10,000.00  |
|   | Fertilizer | 30 bags                    | 3,000.00       | 90,000.00  |
|   |            | TOTAL                      |                | 190,000.00 |
| Discount : Name   |            | Official stamp & signature |                |            |
| Terms of payment: Cash in 30 days upon receipt of goods |            |                            |                |            |

- i) Identify the document above. (1 mark)  
 ii) State two functions of the document named in (i) above. (2 marks)
21. Study the diagram below and answer the question that follows.



Give three problems that may arise due to failure to carry out the practise. (3 marks)

22. The illustration below represents a form of physical measure in soil and water conservation. Study it carefully and answer the questions that follow.



- a) Identify the illustration above. (1 mark)  
 b) Describe how it conserves soil and water. (2 marks)  
 c) Name one other physical measure that can be used to conserve water and soil. (1 mark)

### **SECTION C (40 marks)**

Answer ANY TWO questions in this section on the spaces provided.

23. a) Why is addition of dead and decaying plant and animal remain to the soil important? (8 marks)  
 b) Explain six cultural methods of pest control in crops. (12 marks)
24. a) Outline four effects of weeds on pasture. (4 marks)  
 b) State and explain six factors to consider when designing a crop rotation program. (12 marks)  
 c) Give four measures taken to prevent water pollution. (4 marks)
25. a) Describe ten agricultural support services available to farmers in Kenya. (10 marks)  
 b) Describe field production of beans under the following sub-headings. (3 marks)  
 i) Selection and preparation of seeds. (3 marks)  
 ii) Land preparation. (2 marks)  
 iii) Planting. (5 marks)

**UGENYA UGUNJA JOINT EXAMINATION**

Kenya Certificate of Secondary Education

**AGRICULTURE**

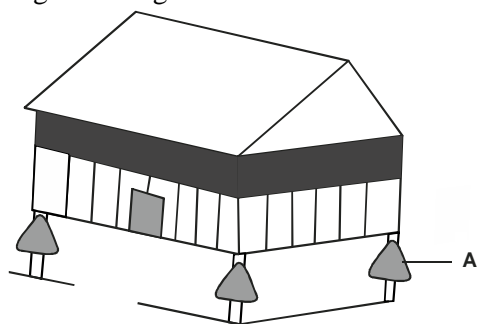
Paper - 443/2

**July / August 2015****Time: 2 hours****SECTION A (30 marks)**Answer ALL the questions in this section in the spaces provided.

1. Name three pig breeds which are white in colour. (1½ marks)
2. Give one structural difference between a claw hammer and a ball peen hammer. (1 mark)
3. State four main causes of diseases in livestock production. (2 marks)
4. Give the appropriate term used to describe the following in chicken. (2 marks)
  - i) From hatching to 8 weeks.
  - ii) Rendered sterile
  - iii) Reared for meat
  - iv) Female from 8 weeks to point of lay
5. List four types of tractor drawn harrows. (2 marks)
6. Give four reasons that may make a farmer prefer concrete to timber in the construction of farm structures. (2 marks)
7. Name any two products processed from milk (1 marks)
8. State four functions of rumen in livestock nutrition. (2 marks)
9. Name three endoparasites that use cattle as hosts. (1½ marks)
10. Mention three methods of selection in livestock breeding. (1½ marks)
11. State four reasons that may make a farmer castrate his/her billy. (2 marks)
12. Give four disadvantages of natural incubation in poultry production. (2 marks)
13. List three protozoan diseases that are spread by vectors. (1½ marks)
14. Name **three** plumbing tools and equipment. (1½ marks)
15. Distinguish between a primary host and an intermediate host. (2 marks)
16. List **two** diseases that attack bees in a colony. (1 mark)
17. State **four** signs of heat in pigs. (2 marks)
18. Name **three** livestock diseases which are controlled by imposition of quarantine. (1½ marks)

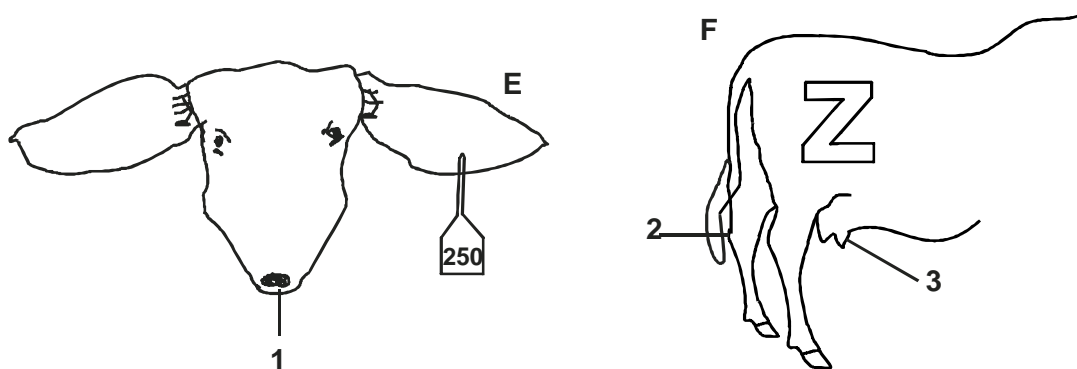
**SECTION B (20 marks)**Answer ALL the questions in this section in the spaces provided.

19. Below is a diagram of a grain store.



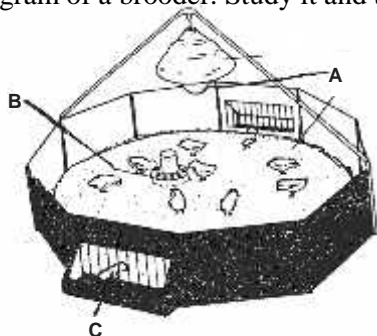
- a) Name the part labelled A. (1 mark)
- b) State the maintenance practices that should be carried out on the store before introducing a new produce (1 mark)
- c) Why is it important to have some open spaces on the walls of the store? (1 mark)
- d) Besides the store having open spaces, state **four** characteristics that make the store suitable for storing grains. (2 marks)

20. Below are two diagrams illustrating methods of identifying animals in a farm.



- Identify the methods of identification illustrated in the diagrams E and F. (1 mark)
- Name the disease that would attack the part numbered 3 in livestock. (1 mark)
- State one disadvantage for each method shown above. (2 marks)
- Name the parts numbered 1 and 2. (1 mark)
- A part from the method of identification illustrated above name any other method used in livestock identification. (1 mark)

21. Below is a diagram of a brooder. Study it and then answer the questions that follow.



- How can the temperature be adjusted in the brooder? (1 mark)
  - Assuming that there is no thermometer, how can a farmer detect that the temperature is high or low? (1 mark)
  - What **two** factors would cause chick mortality? (2 marks)
22. a) A farmer intends to prepare a ration for heifers. The ingredients available are maize (10% C.P) and Soya (35% CP) Calculate the amount of each ingredient required to make a 150kg ration containing 15% CP. (4 marks)
- b) Name the other method of computing ration in livestock nutrition. (1 mark)

### SECTION C (40 marks)

Answer ANY TWO questions in this section in the spaces provided.

- Describe the five factors that influence the power output of an animal. (10 marks)
  - State **five** advantages of battery cage system of rearing poultry. (5 marks)
  - Mention any five practices observed in clean milk production. (5 marks)
- Discuss bloat under:
    - Causes (4 marks)
    - Symptoms (6 marks)
  - Describe the five types of farm produce stores. (10 marks)
- Outline seven practices carried out in the care and maintenance of saws. (7 marks)
  - What are the advantages of artificial insemination in livestock breeding? (10 marks)
  - Explain how nutrition causes livestock diseases. (3 marks)



**KENYENYA FORM FOUR JOINT EXAMINATION**  
**Kenya Certificate of Secondary Education**  
**443/1**  
**AGRICULTURE**  
**Paper 1**  
**July / August 2015**

**SECTION A (30 marks)**

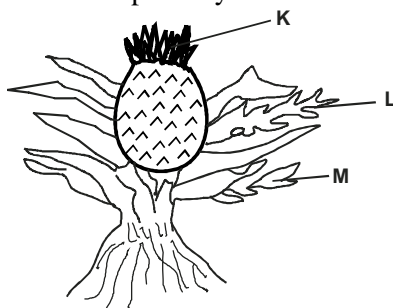
**Answer ALL questions in this section on the spaces provided.**

1. State FOUR factors determining the depth of ploughing land. (2 marks)
2. State FOUR problems facing Agriculture in Kenya. (2 marks)
3. State FOUR ways in which farmers adjust to risks and uncertainties. (2 marks)
4. State TWO reasons of treating water on the farm. (1 mark)
5. State FOUR ways of improving farm labour productivity. (2 marks)
6. Give THREE advantages of tissue culture in crop propagation. (1½ marks)
7. Give FOUR ways in which afforestation help in land reclamation. (2 marks)
8. State FOUR factors that can affect the efficiency of pesticides. (2 marks)
9. Give THREE circumstances under which irrigation is necessary. (1½ marks)
10. State FOUR details that should be included in farm labour records. (2 marks)
11. State THREE ways of maintaining soil fertility during land preparation. (1½ marks)
12. Differentiate between land tenure and land reform. (2 marks)
13. Give the meaning of the following terms:
  - a) Olericulture (1 mark)
  - b) Promoculture. (1 mark)
14. State THREE sources of nutrients to soils. (1½ marks)
15. State FOUR human factors that may influence agricultural production. (2 marks)
16. Name FOUR practices carried out after transplanting tomatoes to achieve optimum production. (2 marks)
17. List two sites of agroforestry trees. (1 mark)

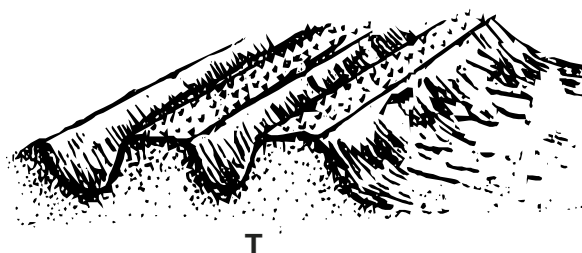
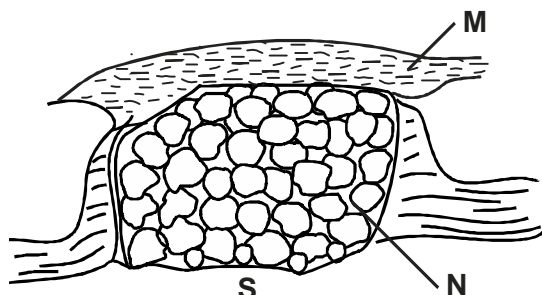
**SECTION B (20 marks)**

**Answer ALL the questions in the spaces provided.**

18. The diagram below illustrates a crop. Study it and answer the questions below.



- a) Identify the parts labelled K, L and M (3 marks)
  - b) A part from the parts mentioned above, list down TWO vegetative materials used for crop propagation. (2 marks)
19. The diagrams labelled S and T illustrate some methods of draining waterlogged fields.



- a) Identify the method illustrated T (1 mark)
- b) What are the materials in S labelled M and N (2 marks)
- c) Name two types of crops that can be planted in the field instead of carrying out the practice illustrated in S and T. (2 marks)

20.a) What is opportunity cost? (1 mark)

b) A farmer has a piece of land on which he can produce, maize and barley. The yields and the selling prices of the crops are as shown below.

| Crop   | Yield (90 kg bags) | Selling price (Kshs /bag) |
|--------|--------------------|---------------------------|
| Maize  | 2500               | 800                       |
| Barley | 2000               | 1500                      |

The farmer decides to produce maize. Assuming the cost of producing any of the two crops is the same;

i) Calculate the farmer's opportunity cost. Show your working. (2 marks)

ii) Which crop should the farmer grow? (1 mark)

c) Give two circumstances under which opportunity cost may not arise. (2 marks)

21. The diagram below shows a common weed. Study it and answer the questions that follow.



a) Identify the weed. (1 mark)

b) Give one reason why it is difficult to control the weed. (1 mark)

c) State two reasons for controlling the weed in a crop field. (2 marks)

### **SECTION C (40 marks)**

Answer any TWO questions from this section in the spaces provided after question 24

22. a) Describe the production of rice under the following sub-headings.

i) Land preparation. (5 marks)

ii) Water control (5 marks)

b) State and explain five cultural methods of disease control in crop production. (10 marks)

23.a) Outline five ways in which wind negatively affects agricultural production. (5 marks)

b) Describe the management practices that should be carried out on trees after transplanting in agro forestry. (5 marks)

c) Outline the problem farmers' face when marketing agricultural produce. (10 marks)

24. a) State and explain five characteristics of a fertile soil. (10 marks)

b) Describe the environmental factors that may lead to poor yield in crop production (10 marks)

**KENYENYA FORM FOUR JOINT EXAMINATION****Kenya Certificate of Secondary Education**

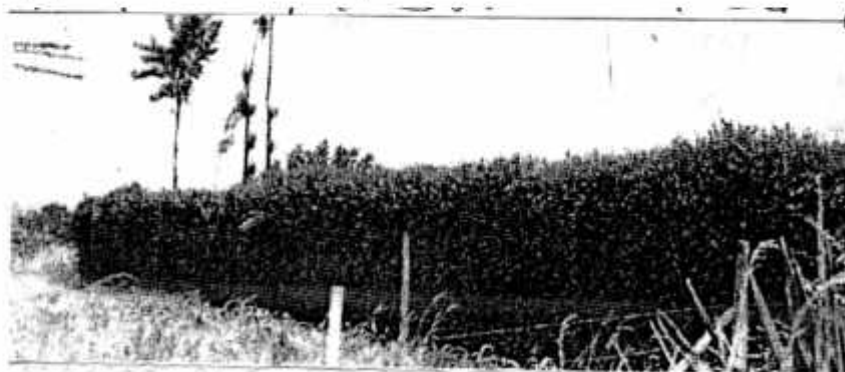
443/2

**AGRICULTURE****Paper 2****July / August 2015****SECTION A (30 marks)**Answer ALL questions in this section on the spaces provided.

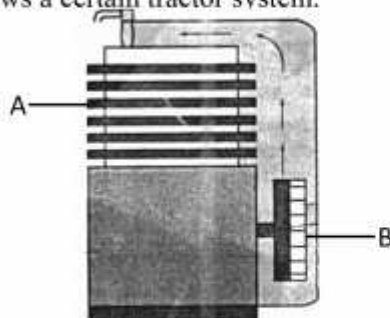
1. List FOUR reasons for inbreeding in livestock production. (2 marks)
2. State FOUR characteristics of concentrates in livestock feeding. (2 marks)
3. State FOUR precautions taken when handling bees. (2 marks)
4. Distinguish between infectious and contagious diseases. (1 mark)
5. State FOUR conditions that encourage hens to eat eggs in poultry house. (2 marks)
6. Name FOUR machines used for harvesting crops (2 marks)
7. Name three dual purpose breeds of sheep. (1½ marks)
8. State TWO functions of carburettor in a tractor. (1 mark)
9. State FOUR uses of solar energy in the farm. (2 marks)
10. Name TWO predisposing factors of coccidiosis. (1 mark)
11. State FOUR factors that hinder milk let down. (2 marks)
12. Name TWO types of linkage on a tractor. (1 mark)
13. State FOUR advantages of Kenya Top bar hive in bee keeping. (2 marks)
14. State two advantages of using seine net over hook and line in fish harvesting. (1 mark)
15. State TWO functions of omasum in poultry digestion. (1 mark)
16. State FOUR symptoms associated with vitamin A (Retinol) deficiency in livestock. (2 marks)
17. Name FOUR categories of farm stores. (2 marks)
18. State three problems that would result in boars which are not castrated. (1½ marks)
19. State two functions of rubber ring and elastrator. (1 mark)

**SECTION B (20 marks)**Answer ALL questions in this section

20. Study the photograph below and answer the questions that follow.



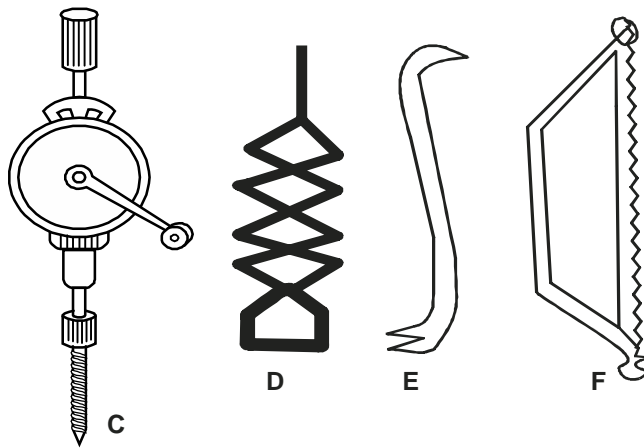
- a) Identify the above structure. (1 mark)
  - b) Name two plant species which can be used to make the above structure. (1 mark)
  - c) State two advantages of the structure shown which help control livestock diseases. (2 marks)
21. The photograph below shows a certain tractor system.



- a) Identify the above tractor system (1 mark)
- b) Name the parts labelled A and B. (2 marks)

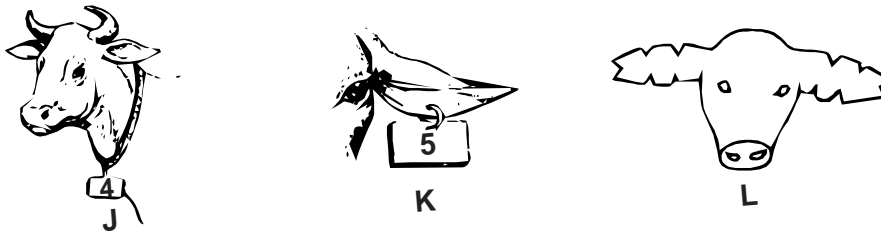
- c) State the function of the part labelled A. (1 mark)  
 d) Give one disadvantage of using the above system. (1 mark)

22. Observe the tools drawn below.



- a) Name the tools labelled . C,D,E,F (2 marks)  
 b) Name the parts labelled 1 and 2 on tool C. (1 mark)  
 c) Give one use of tools D and E. (2 marks)

23. The pictures below shows methods of identification in livestock.



- a) Name the methods labelled. L,K (1 mark)  
 b) Give one advantage of using method L over method K. (1 mark)  
 c) Name two other methods of identification not illustrated above. (1 mark)  
 d) Give three reasons for marking animals for identification. (3 marks)

### **SECTION C (40 marks)**

Answer ONLY two questions in this section. In the spaces provided after question 26

24. a) Outline SIX factors a farmer has to consider when choosing the poultry rearing system (6 marks)  
 b) Explain FOUR reasons for maintaining farm tools and equipments. (4 marks)  
 c) Describe the procedure for establishing a fish pond. (10 marks)
25. a) Describe the functions of the following parts of power transmission system in a tractor. (3 marks)  
 i) the clutch (3 marks)  
 ii) Gear box (3 marks)  
 iii) Differential (3 marks)  
 iv) Final drive (3 marks)  
 b) Explain management practices that should be carried out to control livestock parasites. (8 marks)
26. a) Describe how digestion takes place in small intestine of a pig. (10 marks)  
 b) Explain management practices that should be carried out to a dairy cow during gestation period. (10 marks)

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**AGRICULTURE**  
**Paper 1**

**SECTION A (30 marks)**

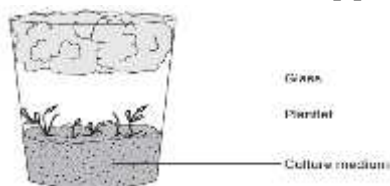
Answer **all** the questions in this section in the spaces provided.

1. (a) State four characteristics of intensive farming. (2 marks)  
 (b) Give two examples of farming enterprises that are practised under intensive farming. (1 mark)
2. What is organic farming? (1 mark)
3. Give four biotic factors that affect agriculture negatively. (2 marks)
4. Mention **three** features of rainfall that influence the choice of crops grown in an area. (1½ marks)
5. State **four** factors that influence the quality and mineral composition of soils. (2 marks)
6. Name the appropriate vegetative material for propagating the following crops:
  - (a) Cassava (½ mark)
  - (b) Sweet potatoes (½ mark)
  - (c) Pineapples (½ mark)
7. Give **two** reasons why there is a higher amount of carbon (IV) oxide in the soil compared to that in the atmosphere. (1 mark)
8. State **two** examples of working capital that a farmer would require in the production of wheat. (1 mark)
9. Name a chemical used to achieve the following during water treatment.
  - (a) Coagulation of solid particles (½ mark)
  - (b) Softening of water (½ mark)
  - (c) Killing pathogens (½ mark)
10. Outline **three** possible causes of chlorosis in crops. (1½ marks)
11. Differentiate between a hybrid and a composite crop, as used in maize breeding. (1 mark)
12. What are the functions of each of the following in the preparation of compost manure?
  - (a) Foundation stones (1 mark)
  - (b) Wood ash (1 mark)
  - (c) Top soil (1 mark)
  - (d) A stick driven into the compost heap (1 mark)
13. (a) What is opportunity cost? (½ mark)  
 (b) A farmer has the option of growing wheat, maize or beans in his one hectare piece of land. Wheat gives a return of Ksh. 40,000, maize a return of Ksh. 25,000 and beans a return of Ksh. 30,000. What would his opportunity cost be if he chose to grow wheat? (½ mark)  
 (c) Give **two** conditions under which opportunity cost is zero. (1 mark)
14. State **three** advantages of landlord-tenancy tenure system. (1½ marks)
15. State **two** disadvantages of contract production in agriculture. (1 mark)
16. State **three** routine management practices for trees. (1½ marks)
17. Give a reason why it is not advisable to add organic manure to a carrot field. (1 mark)
18. State **four** factors that can lead to failure in pasture establishment. (2 marks)

**SECTION B (20 marks)**

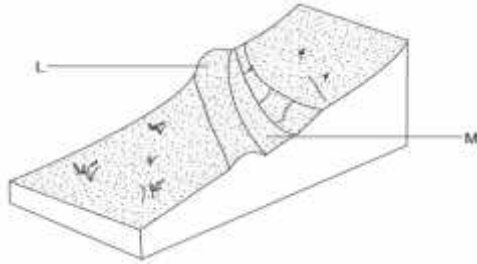
Answer **all** questions in this section in the spaces provided.

19. The diagram below illustrates a method of crop propagation. Study it and answer the questions that follow.

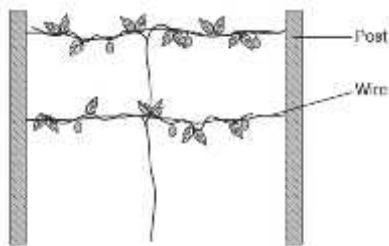


- (a) Identify the method of propagation shown in the illustration. (1 mark)
- (b) Name a crop successfully propagated using the method mentioned above. (1 mark)
- (c) State **two** advantages of using this method of crop propagation. (2 marks)

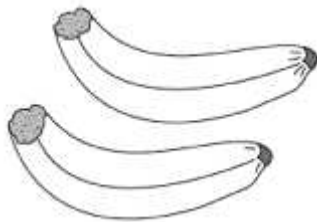
20. The figure below shows a certain structure which is used in soil and water conservation. Study it carefully and answer the questions that follow.



- (a) Identify the structure illustrated above. (1 mark)  
 (b) Name the parts labelled **L** and **M** and state the function of each part. (4 marks)  
 (c) Describe the process of constructing the structure shown above. (4 marks)
21. The diagram below illustrates a field management practice. Study it carefully and answer the questions that follow.



- (a) Identify the field practice. (1 mark)  
 (b) Name a crop that can be managed using the above practice. (1 mark)  
 (c) Give **two** reasons for carrying out the above practice. (2 marks)
22. The diagram below shows banana fruits which have been attacked by a certain disease. Study it and answer the questions that follow.



- (a) Identify the disease. (1 mark)  
 (b) Name the causal organism of the disease. (1 mark)  
 (c) State **one** method of controlling the disease. (1 mark)
- SECTION C (40 marks)**  
*Answer any two questions from this section in the spaces provided.*
23. (a) State and explain any **five** cultural methods of controlling weeds. (10 marks)  
 (b) Describe the harmful effects of pests on crops. (10 marks)
24. (a) Describe the establishment and management of Guatemala grass from the time the land is ploughed using a mouldboard plough, to the time the pasture is ready for defoliation. (10 marks)  
 (b) Give **six** precautions taken when harvesting cotton. (6 marks)  
 (c) Explain the harvesting of cabbages. (4 marks)
25. (a) Explain the problems faced by farmers when marketing agricultural produce. (12 marks)  
 (b) Explain **four** factors that should be considered when selecting seeds for planting. (8 marks)

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**AGRICULTURE**  
**Paper 2**

**SECTION A (30 marks)**

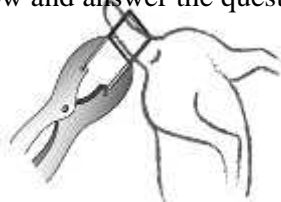
Answer *all* the questions in this section in the spaces given.

1. Name **four** farm structures used for the control of livestock parasites. (2 marks)
2. Explain the meaning of dry cow therapy as used in livestock production. (1 mark)
3. State **three** conditions in a breeding boar which may necessitate culling. (1 mark)
4. State **two** reasons why lactating dairy goats require calcium. (1 mark)
5. Identify **four** undesirable characteristics of indigenous cattle that make them unpopular with farmers. (2 marks)
6. Name the intermediate host of liver flukes. (1 mark)
7. Distinguish between stress and vice, as used in livestock production. (1 mark)
8. Give the reason why eggs are packed with the broad end facing upwards. (1 mark)
9. State **four** factors affecting milk composition. (2 marks)
10. Outline **four** advantages of using animal power over tractor power. (2 marks)
11. State the function of each of the following tools:
  - (a) Pruning saw (½ mark)
  - (b) Dibber (½ mark)
12. Give **four** requirements of a produce store. (2 marks)
13. State **four** control measures of tsetse fly. (2 marks)
14. Name **one** sheep breed which is resistant to foot rot and worm infestation. (1 mark)
15. State the ratio of cement, sand and aggregate used in preparation of concrete blocks. (1 mark)
16. State **four** symptoms of scours in a calf. (2 marks)
17. State four factors that determine the amount of water taken by an animal. (2 marks)
18. Name **four** equipment used when harvesting honey from Kenya top bar hive. (2 marks)
19. State **five** advantages of artificial insemination. (2 ½ marks)

**SECTION B (20 marks)**

Answer *all* questions in this section in the spaces provided.

20. Study the diagram below and answer the questions that follow.

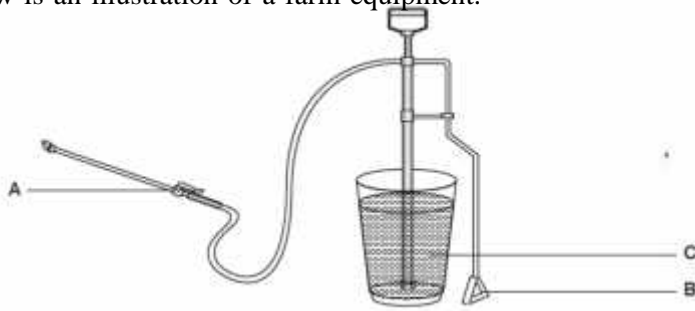


- (a) Identify the operation shown in the diagram. (1 mark)
  - (b) Name the tool and equipment used. (1 mark)
  - (c) Give **three** reasons why the operation is practised in Kenya. (3 marks)
21. The diagram below represents an operation carried out on livestock. Use it to answer the questions that follow.



- (a) Identify the operation. (1 mark)
- (b) Outline the procedure for the operation shown in the diagram above. (4 marks)

22. Below is an illustration of a farm equipment.



- (a) Identify the above equipment. (1 mark)  
 (b) Name the parts labelled **A** and **C**. (2 marks)  
 (c) Give **two** maintenance practices for the above equipment. (2 marks)
23. Below are illustrations of parasites which transmit disease in livestock. Study them carefully and answer the questions that follow.



- (a) Identify specimens **K** and **L**. (1 mark)  
 (b) Name **one** disease each, transmitted by the parasites **K** and **L**. (2 marks)  
 (c) State **two** mechanical control measures for parasite **L**. (2 marks)
- SECTION C** (40 marks)  
 Answer any **two** questions.
24. (a) Discuss the construction of a dairy shed under the following topics:  
 (i) Construction material (4 marks)  
 (ii) **Six** maintenance practices of the structure (6 marks)  
 (b) Outline **five** differences between a good layer and a poor layer. (10 marks)
25. (a) Describe the management of pigs during parturition. (10 marks)  
 (b) Give the differences between a petrol engine and a diesel engine. (10 marks)
26. (a) Describe the life cycle of beef tapeworm (*Taenia saginata*). (10 marks)  
 (b) State and explain **five** reasons for maintaining farm tools and equipment. (10 marks)