TOPICS COVERED

SECTION I QUESTIONS

SECTION I : QUESTIONS

INTRODUCTION TO AGRICULTURE

This topic entails the following:-

- Definition of agriculture
- Main branches of agriculture
- Farming systems
- Farming methods
- Role of agriculture to Kenya's economy
- Varied opportunities in agriculture.

The following relevant questions and their answers in this topic will help and motivate the user to comprehend and understand the required concepts and practices:

1. Give **two** factors which characterize intensive farming
2. State **three** reasons why organic farming is encouraged in farming
3. State **two** ways in which agriculture contributes to industrial development
4. State **four** ways by which wind affects the growth of crops
5. State **one** physical characteristic used in classifying soil
6. Outline **four** advantages of organic farming
7. State **two** conditions under which shifting cultivation is practiced
8. Differentiate between the following terms as used in Agriculture:-
   (a) Oleculture and floriculture
   (b) Apiculture and aquaculture

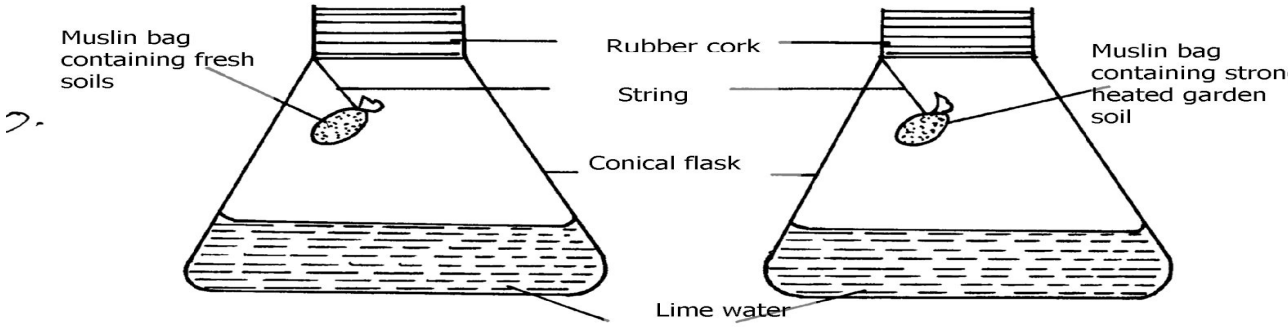
FACTORS WHICH INFLUENCE AGRICULTURE

In this topic, the following factors influence agriculture.

-Human factors e.g. -level of education, -Health HIV/AIDS, -Economic status of the farmer e.t.c
- Biotic factors e.g. pests, parasites, decomposers, pathogens, pollinators, predators e.t.c.
- Climatic factors e.g. rainfall, temperature, wind and relative humidity, light
- Edaplus factors e.g. type of soils, soil profile, soil structure, soil texture, soil chemical properties.

The following relevant questions and their answers in this topic will greatly help and motivate the user to comprehend and understand the required concepts:

1. State **two** roles of humus in the soil that are beneficial to crops
2. a) outline **five** activities that may be undertaken in organic farming
3. List **four** effects of temperature on crop growth
4. State **four** ways by which wind affects the growth of crops
5. Name **two** factors related to light that affect crop production and distribution in Kenya
6. Describe the environmental conditions that may lead to low crop yields
7. List **three** environmental factors that affect crop distribution in Kenya
8. State **one** physical characteristic used in classifying soil
9. Outline **four** advantages of organic farming
10. The diagrams below show an experiment carried out by a form 1 class. Study them carefully and answer questions that follow:



(a) What was the aim of the experiment?

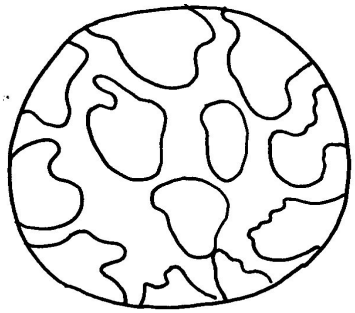
(b) What was the observation that form 1 students made at the end of the experiment in flasks **D** and **E?**

(c) Give the reason for the observation made in flask **D**

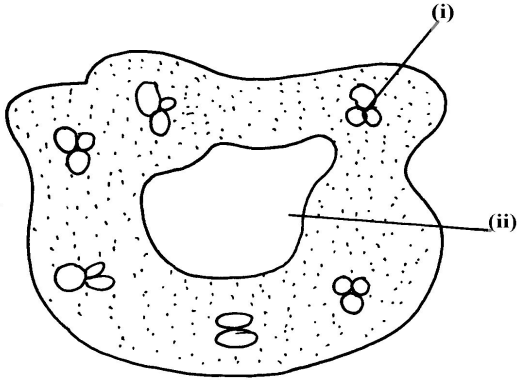
12. Briefly explain how sub-soil as a horizon in a soil profile can affect soil productivity
13. (a) What are the **three** aspects of light that are important to a farmer?

(b) Mention **three** ways through which relative humidity affect crop production

14. The diagram labeled **E** and **F** below illustrates some type of soil structure. Study the diagrams carefully and answer the questions that follow:



E



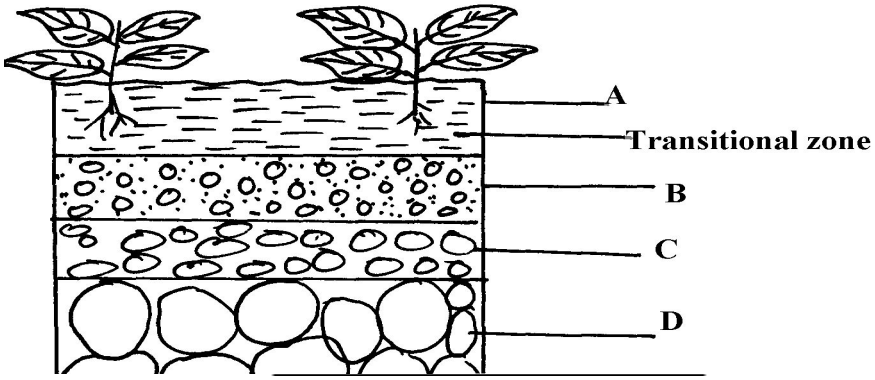
F

(a) Identify the types of soil structure illustrated in diagrams **E** and **F**

(b) Identify the parts labeled **(i)** and **(ii)** in diagram **F**

(c) Outline the influence of physical characteristics of soil on its properties

15. State **three** physical characteristics of soil
16. Study the diagram below and answer the questions that follow



a) State merits of horizon **A**

b) State distinct features of horizon **B**

c) What does the term **transition zone** refer to in soil profile

i) Name horizon **C** and state its importance

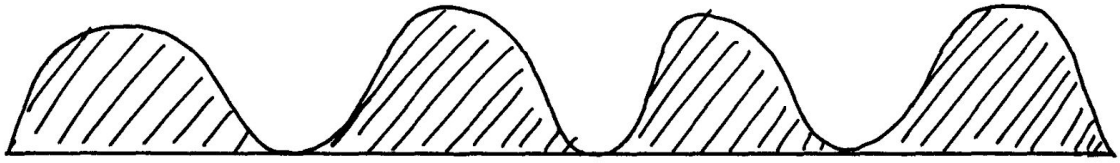
17. Outline **two** ways temperature affects crop production
18. List **four** ways by which biological agents can enhance the process of soil formation
19. List **four** environmental factors that affect crop production in Kenya
20. Explain the role played by topography in soil formation
22. Mention **two** importance of parent's material in soil profile
23. Mention **four** ways of modifying soil temperature in crop production

24. a) Mention **two** factors that affect selectivity of herbicides
    b) Name **two** farming practice that cause water pollution
25. Give **four** factors that influence soil formation
26. State **three** properties of soil that is influenced by soil texture
27. Name any t**hree** agents of biological weathering

CROP PRODUCTION I (LAND PREPARATION)

- Land preparation entails the following farming practices.
- Land clearing or bush clearing tools, chemicals and equipment used.
- Primary cultivation, tools and equipment as machines used.
- Primary cultivation, tools and equipment as machines used.
- Secondary cultivation, tools and equipment used.
- Tertiary operations e.g. ridging, rolling and leveling.
- Sub-soiling, tools used and reasons for the same.
- Minimum tillage and reasons for the secure.

The following relevant questions and their answers in this topic will greatly help and motivate the user to comprehend and understand the required concepts and farming practices:

1. Give **three** factors that determine depth of ploughing during land preparation
2. List **four** reasons for cultivating land before planting
3. (a) What is minimum tillage?
   (b) Give four farming practices that help in achieving minimum tillage.
4. (a) Describe the establishment of grass pasture from the time the land is ploughed using a mould board plough to the time the pasture is ready for grazing
   (b) Explain **five** practices that a farmer should carry out to ensure uniform germination of seeds (c) Describe **five** factors that determine the number of cultivations when preparing a seedbed
5. State **four** physical conditions of the seedbed that need to be changed to facilitate germination
6. State **four** importance of sub soiling as a tertiary operation
7. Outline **four** advantages of rolling in seedbed preparation
8. State **four** disadvantages of minimum tillage
9. 

The diagram below illustrate a tertiary operation carried out in the farm

   a) Identify the tertiary operation
   b) (i) State the importance of the tertiary operation identified in **20(a)** above
      (ii) Give **two** other tertiary operations carried out in the field besides the one identified above
10. Give **two** reasons why it is advisable to cultivate the field during the dry season
11. How are hard pans caused by cultivation?
12. Give **four** factors that determine the number of secondary cultivation operations
13. Define the term minimum tillage
14. List four advantages of timely planting
15. State any **two** factors that determine the number of cultivation on a field before it is ready for

planting

17. Give **three** benefits of timely planting of annual crops
18. State **four** factors determining the depth of ploughing land

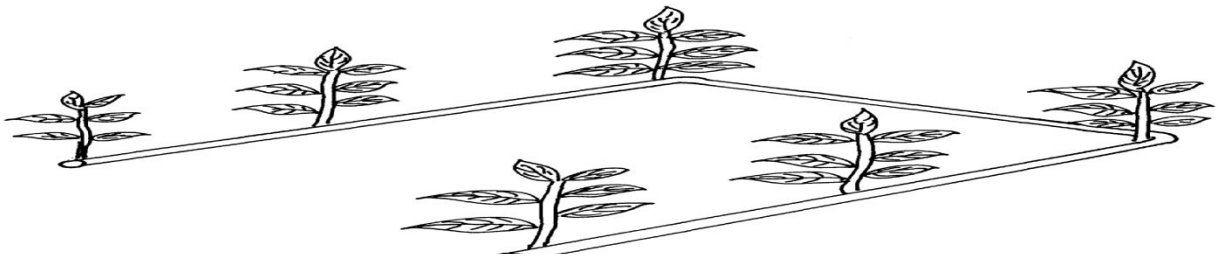
WATER SUPPLY, IRRIGATION AND DRAINAGE

This topic entails the following:

- Hydrological cycle
- Sources of water on the farm
- Water collection and storage
- Pumps and pumping of water
- Types water pipes
- Water treatment
- Uses of eater of the farm.
- Types of irrigation advantages and disadvantages.
- Importance and methods of drainages
- Water pollution causes and prevention.

The following relevant questions and their answers in this topic will greatly help and motivate the user to comprehend and understand the required concepts and practices:

1. State **two** reasons for treating water for us on the farm
2. State **three** reasons for draining swampy land before growing crops



3. Use the diagram below of irrigation method to answer the questions that follow.

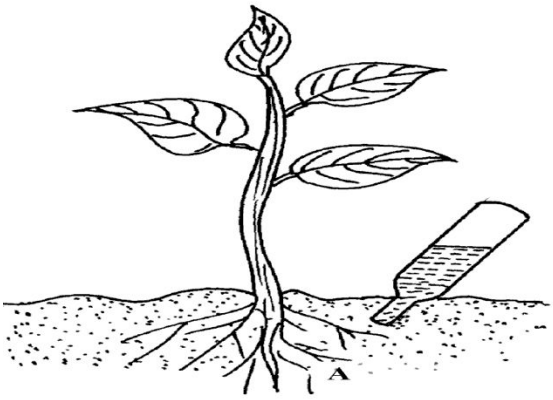
a) Identify the method of irrigation
b) State **four** advantages of the above irrigation system
c) State **three** factors that determine the type of irrigation on the farm
d) State **two** disadvantages o f the above system of irrigation

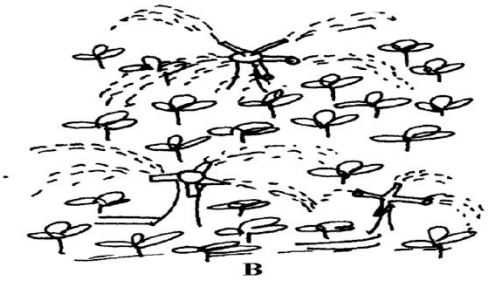
4. a) What is **irrigation**
   b) Outline **three** methods of irrigation
5. a) List **four** use of water on the farm
   b) Give **four** methods of harvesting water on the farm
   c) Outline the stages involved in water treatment process
6. List any **four** uses of water in the farm
7. State **two** types of irrigation used in Kenya
8. Outline **four** disadvantages of cambered beds

Describe the process of water treatment

9. Give **four** roles of drainage as a method of land reclamation
10. Name **two** types of water pumps which can be used in the farm
11. Name any **four** examples of working capital in maize production
12. List **four** types of water pumps which can be used in the farm
13. State **four** methods of drainage
14. Distinguish between **a dam** and **a weir**
15. How do the government control prices of essential farm produce
16. What is the difference between pumping and piping of water in the farm?
17. List four reasons of draining water logged soils before planting.
18. Give three Agricultural practices which lead to water pollution

19. The diagrams below illustrate some methods of irrigating crops in the field. Study the diagrams



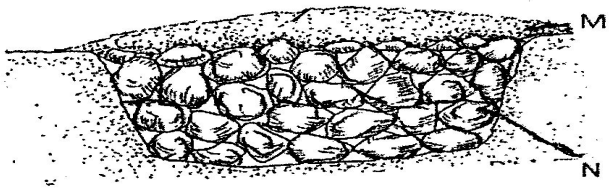


and answer the questions that follow:

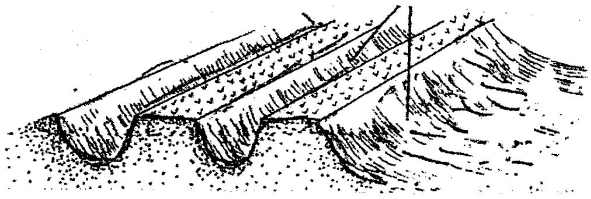
(a) Identify the methods used ; (i) A (ii) B
(b) State **two** advantages of method **A** over method **B**
(c) What material should be inserted at point **T**
b) Name **two** farming practice that cause water pollution

20. Give **four** reasons for practicing irrigation
22. a) State **four** importance of water to plants
b) State **four** reasons for treating water before use c)
Describe water treatment system in a chemical treatment plant

23. Name **four** diseases caused to man by drinking untreated water
24. State the functions of the following chemicals as used in water treatment;
    (a) Chlorine.
    (b) Aluminum sulphate (AIlum)
21. The diagrams labeled **S** and **T** illustrate some methods of draining waterlogged fields; use it to answer the questions that follow:



S



T

(a) Identify the methods illustrated
(b) What are the materials in **S** labeled **M** and **N**
(c) Name **two** types of crops that can be planted in the field instead of carrying out the practice illustrated in **S** and **T**
(d) What is the importance of carrying out land reclamation?

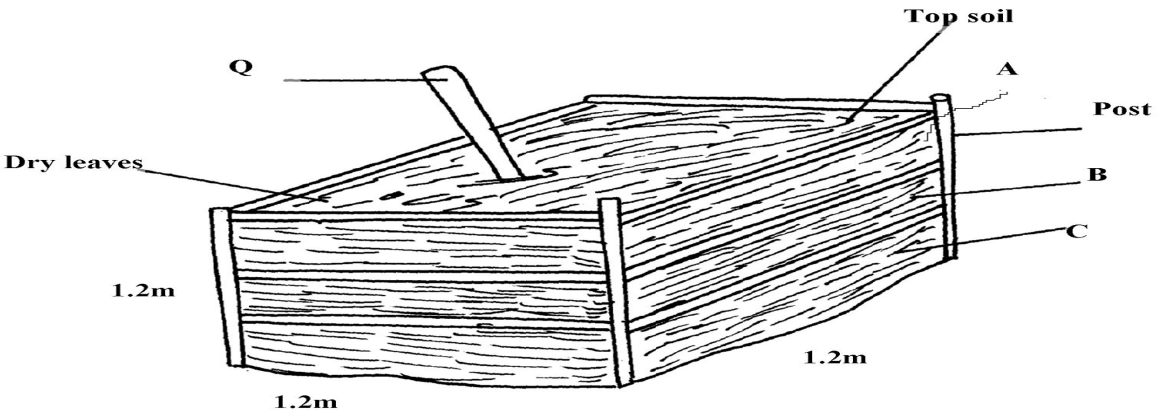
SOIL FERTILITY 1 (ORGANIC MANURE)

This topic entails the following:

- Characteristics of a fertile soil
- How soil loses soil fertility
- Soil fertility maintenance
- Reasons of adding organic matter to soil
- Disadvantages of organic manure
- Types of organic manure i.e green manure, farm yard manure and compost measure.

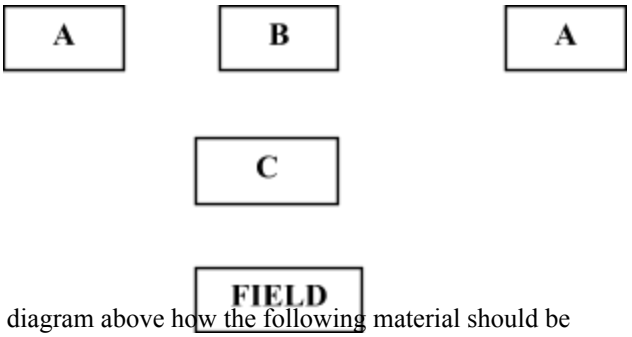
The following relevant questions and their answers in this topic will greatly help the user to comprehend and understand the required concepts and practices:

1. State **two** roles of humus in the soil that are beneficial to crops
2. List **four** characteristic of fertile soil
3. The diagram below illustrates a compost heap. Study it and answer the questions that follow



a) Name the part labeled **Q** and state its function
b) What is the function of each of the following components in preparation of compost manure
   i) Top soil
   ii) Wood ash
   iii) Rotten manure

4. The illustration below shows a four heap system of making compost manure. Study it and answer the questions that follow.



(a) By use of arrows indicate on the diagram above how the following material should be transferred from one heap to another till the manure is applied in the field
(b) How long does the material take to be ready for application in the field as manure?
(c) Give a reason for turning the material in the heap regularly
(d) Give **two** reasons why it is necessary to sprinkle water on the heap

5. Name **four** indicators of well-decomposed manure

6. (a) State **two** factors that should be considered when siting a compost manure heap
(b) When preparing compost manure, explain the importance of each of the following:-
(i) Addition of ash
(ii) Regular turning of the compost manure

7. What is **leaching**?
8. State **four** advantages of adding organic matter to a sandy soil
9. (a) Describe the preparation of the following farm materials:-
   (i) Farm yard manure
   (ii) Hay
   (b) Explain the factors considered in timely planting of annual crops
10. A ration containing 18% protein is to be made from maize and sunflower cake. Given that maize contains 7% protein, and sunflower seed cake 34% protein. Use Pearson square method to calculate the value of feedstuffs to be used to prepare 100kgs of the feed
    ii) A part from Pearson square method, name **two** other methods that can be used to formulate feed ration

AGRICULTURE ECONOMICS
(BASIC CONCEPTS AND FARM RECORDS)

This topic entails the following

- Definition of scarcity, preference and classic, opportunity cot as used in agriculture production.
- Uses of farm records
- Types of farm records i.e production records, filed operation records, breeding records, feeding records, health, labour records and master roll.

The following relevant questions and their answers in this topic will greatly help and motivate the user comprehend and understand the concepts and practices.

1. (a) What are the uses of farm records to a farmer?

2. Identify the farm record below and the questions that follow:

Date	**Disease symptoms**	**Animals affected**	**Drug used**	**Cost of treatment**	**Remarks**

   (a)Identity of the record
   (b) State **two** different information that should be entered in the remarks column
   (c) Give **two** importance of keeping the farm record illustrated above
3. State **four** uses of farm records
4. State **four** uses of farm records
5. Outline **two** ways the level of education and technology influence the efficiency of agricultural production
6. Study the illustration below of farm records:- Use it to answer the questions that follow:

Enterprise
Month

Name of cow	**DAYS IN MONTH**											
	1		2		3		4		5		6	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM

   (a) Name the type of the farm record illustrated above
   (b) Give **three** reasons for keeping health records in a livestock production
   (c) Give **three** pieces of information a dairy farm manager should collect for planning purposes
7. List down four pieces of information recorded in a field operation record.
8. List **two** events occur during induction stroke in a four stroke engine
9. Give **two** conditions under which a farmer may prefer the use of donkey trailed cart instead of a tractor drawn trailer in his farm

Form 1 work ANSWERS

INTRODUCTION TO AGRICULTURE

1. two factors which characterize intensive farming
   - Small farms
   - Huge capital
   - Skilled labour
   - Produce for sale

   Mechanization done
2. three reasons why organic farming is encouraged in farming
   - Cheap
   - Environmental friendly

   No chemical residues in produce
3. two ways in which Agriculture contributes to industrial development.
   - Provide raw materials for industries.
   - Provide market for industrial goods.
   - Is a source of capital for starting industries.
4. four ways by which wind affects the growth of crops.
   - Causes physical damage to crops.
   - Cause rapid spread of diseases/ pests/ weeds.
   - Can cause water stress as a result of evaporation.
   - Causes stress of crops due to chilling caused cold winds.
   - Encourage transpiration hence water and mineral uptake.

   - Agriculture – rearing of fish in fish ponds
5. One physical characteristic used in classifying soil is:
   - Colour,
   - Texture,
   - Structure
6. Four advantages of organic farming
   - Environmental friendly
   - Products do not have organic farming
   - Products do not have organic chemical residue
   - Improve soil structure
   - Replenishes nutrients in the soil as it uses organic manure
   - Enhances soil water retention
   - Provides food for soil microbes
   - Enhances soil water infiltration
7. Two conditions under which shifting cultivation is practiced are:
   - Can only be practiced where land is abundant
   - Practiced where population is sparse

- Practiced where number of livestock per units low (2 ½mks)

8. Four factors that determine the time of planting a crop
   (a) Olericulture – production of vegetables
   - Floriculture – production of flowers
   (b) Apiculture – bee keeping
   - Agriculture – rearing of fish in fish ponds

FACTORS WHICH INFLUENCE AGRICULTURE

1. two roles of humus in the soil that are beneficial to crops
   - Provide nutrients
   - Increase water holding capacity
   - Increase soil temperature
   Neutral soil PH

2. a) five activities that may be undertaken in organic farming
   - Mulching
   - Apply manure
   - Use medicinal plants to control parasites and diseases
   - Crop rotation
   - Rear livestock on natural organically grown pasture
   - Physical/ cultural/ biological/ pests, weeds and disease control

3. four effects of temperature on crop growth
   Low temp-slow growth rate
   -increase incidence of negative infection e.g. CBD
   -improve quality of some crop
   High temp-cause wilting
   -increase growth rate
   -improve quality of some crops
   -increase pest and disease incidences (1/2x4=2mks)

4. four ways by which wind affects the growth of crops.
   - Causes physical damage to crops.
   - Cause rapid spread of diseases/ pests/ weeds.
   - Can cause water stress as a result of evaporation.
   - Causes stress of crops due to chilling caused cold winds.
   - Encourage transpiration hence water and mineral uptake.

5. Two factors related to light that affect crop production and distribution in Kenya:-
   - Light intensity
   - Light duration
   - Light wavelength

6. The environmental conditions that may lead to low crop yields
   - Poor soil fertility /infertile soil
   - Damage by hailstorms
   - Less rainfall/unreliable/drought
   - Poor soil type resulting into leaching or water logging
   - Inappropriate soil PH
   - Inappropriate temperature (too low or high)
   - Excessive wind leading to increase in water loss from the soil
   - Extreme relative humidity
   - Extreme of light intensity
   - Topography / some attitudes e.g. very high may limit crop growth (1mk x any 7pts = 7mks)

7. - Rainfall
   - Soil
   - Topography
   - Light
   - Wind

8. One physical characteristic used in classifying soil is:
   - Colour,
   - Texture,
   - Structure

9. Four advantages of organic farming
   - Environmental friendly
   - Products do not have organic farming
   - Products do not have organic chemical residue
   - Improve soil structure
   - Replenishes nutrients in the soil as it uses organic manure
   - Enhances soil water retention
   - Provides food for soil microbes
   - Enhances soil water infiltration (4x ½ = 2mks)

10. (a) The aim of the experiment was:- to show presence of living organisms in the soil
    (b) observations were:
    - Flask D - Limewater turns milky/turbid (1mk)
    - Flask E – Lime water remains clear (1mk)

    (c) The reason for the observation in flask D is:-
    Carbon dioxide which turns water milky in flask D would have been produced only during the respiration of living organisms present in fresh soil

11. - It may have hard pan which interfere with water infiltration

12. a) - Light duration
    - Light intensity
    - Light wave length (½ x3=1 ½ mks)

b) Evapotranspiration
- Presence of pest

13. a) - E – Single grained structure
- F – Granular structure (1x1=1 mk)

b) i) Humus with clay (1x1=1 mk)

ii) Air space (1x1=1 mk)

c)- Colour affects soil texture and hence micro- organisms in the soil √
- Texture – affects drainage, aeration and capillary
- Structure – affects aeration and root penetration

14. three physical characteristics of soil (1 1/2mks)
- Soil structure
- Soil texture
- Soil colour

15. a) State merits of horizon A
- source of plant nutrients
- support/anchor the crops
- store of water for the crops
- sources of soil micro organism

b) State distinct features of horizon B
- deficient of humus(nutrients)
- contain leached nutrients
- contains more compact soil particles
- presence of hard pans in some soils

c) Transitional zone-this is a zone bordering two adjacent layer of soil profile

i)Weathered rock

<u>Importance</u>
- Give rise to sub soil
- Source of minerals
- Determine mineral content of soil and type of soil

16
- Low temperatures encourages crop diseases such as leaf rust
- Low temperatures may increase or lower the quality of farm produce
- High temperatures hastens maturity/ improves the quality/ lower the quality
- Increases the rate of evapo transpiration which may result loss plant moisture/ leading to wilting of crops

17.
- Movement of animals in large numbers
- Decomposition of plant and animal remains by soil micro- organisms
- Physical breaking of rocks by roots of higher plants
- Man's activities e.g. cultivation, mining and road construction
- Mixing up of soil by animals e.g. earth worms and

18. - Temperature/ Altitude
- Soil type;
- Prevailing winds;

- Rainfall; (4x ½ =2mks)

19. - It influences the movement of the weathered materials hence affecting the depth of soil development;

22. two importance of parent's material in soil profile
- Determine soil characteristics
- Determine soil depth

Determine soil nutrients

23. four ways of modifying soil temperature in crop production
  - Mulching
  - Pruning
  - Shading of crops
  - Irrigation (4x ½ mks)

24. a) two factors that affect selectivity of herbicides
- Stage of plants growth
- Plants morphology and anatomy
- Mode of action
- Environmental factors (2x1=2mks)

b) Name two farming practice that cause water pollution

25. four factors that influence soil formation
- Parents rock material
- Climate
- Topography
- Biotic/organic/living organism

26. - Drainage
-Aeration
-Water-holding capacity
-capillary

27. -large animals e.g. Buffaloes
-Man activities e.g. farming
-Root pressure of plants
-Burrowing animals e.g moles, termites

CROP PRODUCTION I (LAND PREPARATION)

1. three factors that determine depth of ploughing during land preparation
- Crop to be planted
- Implement available

Type of soil

2. Four reasons for cultivating land before planting.
- To improve soil aeration.
- To improve germination.
- Destroy weeds.
- Destroy weeds.
- Incorporate organic matter in the soil.

- Increase water infiltration.

3. (a)Is a situation in which least possible cultivation operations are carried out in crop production.

(b) - Clearing the land / bush clearing.
- Using appropriate chemicals to kill the existing vegetation.
- Weeding using herbicides.
- Planting / drilling seeds directly into the stubble of previous crop.

4. (a) - Harrow the land to a fine filth;
- Harrow during the dry or before the rains;
- Make the seed be weed – free / ensure clean seed bed;
- Firm the seed bed using rollers after sowing;
- Select a desirable variety of seed for the ecological zone,;
- Sow seeds at the onset rains/ early planting;
- Apply phosphatic fertilizers at appropriate rate of 200 – 300 kgs/ ha at planting time;
- Drill or broadcast the seeds evenly;
- Use a recommended seed rate for the variety / seed rate of 1.5 – 2.0 kh/ha pure seeds;
- Bury seeds at 2 ½ times their diameter;
- Control weeds by uprooting/ apply a suitable herbicide;
- Apply nitrogenous fertilizers about 6 weeks after germination in split application.
- Avoid grazing when the pasture is too young.
- Practice light grazing in the field phase of pasture establishment. (10 x 1 = 10 mk)

(b) - Select seeds of the same size, variety, age and free from pests and diseases.
- Plant seeds at the same time.
- Prepare the whole field to required uniform tilth.
- Plant at the right moisture content of the soil / irrigation uniformly.
- Treat seeds before planting i.e. break dormancy.
- Plant at the correct depth. (5 x 1 = 5 mks)

(c) - Soil moisture content.
- Type of soil.
- Cost of operation.
- Size of seed/ type of planting material/ type of crop.
- Type of machinery available / use of tractors.
- Topography / gradient of the land/ liability of soil erosion.
- Skills of the operator.
- Initial conditions of the land/ the cropping history of the land.
- Time available to carry out the operation before planting.

5. Four physical conditions of the seedbed that need to be changed to facilitate Germination
- Size of soil clods (clods (made small or medium size
- Appropriate soil depth
- Soil looseness
- Should be weed free
- Soil moisture content improved

6. Four importance of sub soiling as a tertiary operation
   - Brings leached nutrients to the surface
   - Breaks hard pans
   - Promotes aeration of the soil
   - Promotes water infiltration
   - Ensures better root penetration

7. Four advantages of rolling in seedbed preparation are:
   - Press the seeds against the soil moisture
   - Controls soil erosion
   - Ensure uniform germination
   - Controls removal of small seeds by wind
   - Breaks large soil cods

8. four disadvantages of minimum tillage
   - The less porous surface increased soil erosion especially in heavily sols
   - Difficulty in weed control
   - Speed of planting to reduce due to large amount of residues in the soil and big clods
     Leads to accumulating of soil borne pests and diseases

9. a) - ridging
   b) (i) Encourage tuber expansion
   - Allow easy harvesting of crop roots
   (ii) Rolling
   - Leveling

10.
   - Leads to timely planting
   - Weeds are appropriately controlled especially the perennial such as couch grass
   - Farmers take advantage of availability of labour reducing the cost of labour
   - Control of soil borne pests
     Gives time for better organic decomposition

11. - By repeated cultivation at the same depth;
    - Cultivating the soil when wet using heavy machinery;

12. - Type and size of planting material;
    - Topography/slope f land;
    - Soil moisture content;
    - (Initial) condition of land/amount of vegetation on the land;
    -Capital available
    - Type of implement used;

13. It is the least number of cultivation operations either during preparation of the seed bed or during the management of the crops.

14.
   - Market demand
   - Type of crop to be planted
   - Moisture condition of the soil and rainfall pattern

- Prevalence of pests and diseases
- Prevalence of weeds

15. two factors that determine the number of cultivation on a field before it is ready for planting
    - purpose of crop
    - moisture content
    - concentration of desired chemical
    - weather
    - market demand
16. - Enables crop to benefit maximumly from available moisture
    -Crops make use of nitrogen flush available at that time
    -Crops fetch high market prices
    -Crops escape from pests and diseases
    -There is high vigour in crops that resist diseases
    -Ensures timely harvesting
17. - type of crop to be planted
    -Implements available
    -Type of soil
    -Climatic conditions

WATER SUPPLY, IRRIGATION AND DRAINAGE

1. State two reasons for treating water for us on the farm
    - Remove chemical impurities
    - Remove foreign material
    - Remove disease earning organisms

    Remove bad smell & taste
2. State three reasons for draining swampy land before growing crops
    - Increase soil volume
    - Improve aeration
    - Increases activities of micro organisms
    - Control erosion

    Reduce toxic substance in soil
3. a)Sprinkle irrigation

    b) four advantages of the above irrigation system
    - Little water required
    - Done on nay topography
    - Control weeds between rows
    - Water under low pressure
    - Prevent fungal diseases

    c) three factors that determine the type of irrigation on the farm
    - Where tree crops are planted
    - Little water supply
    - Enough capital for the method is available
    - Slope land 3x ½ = 1 ½ mks

d) two disadvantages o f the above system of irrigation

- Difficult to carry field mechanization
- Require a lot of capital
- Require clean water
- Regular repair of broken pipes and blocked pipes

Applicable where tree plants are grown

4. a) Artificial√ application of water to the soil surface for purpose of supplying enough moisture√ for plants growth(mark whole)

   b) Surface,
   overhead,
   subsurface,
   drip/trickle

5. a) four use of water on the farm
- Irrigation
- Domestic use
- Diluting chemicals
- Construction work
- Watering livestock and washing buildings
- Processing farm produce(1/2x4=2mks)

b) four methods of harvesting water on the farm (2mks)
- roof cantonment
- weirs
- rock cantonment
- dams
- ponds

c) the stages involved in water treatment process
- filtration of water intake
- softening
- coagulation and sedimentation
- filtration in tanks
- chlorination storage (1/2x6=3mks)

6. four uses of water in the farm.
   - For diluting chemicals used to control pests.
   - For watering livestock.
   - For watering plants e.g. irrigation.
   - For washing utensils, calf pen bully sheds.
   - For domestic use e.g. drinking, cooking.
   - For rearing fish.
   - For recreation
   - Processing of farm produce.
   - In construction of buildings.

7. two types of irrigation used in Kenya.
   - Overhead / sprinkler.

- Surface / Flood / furrow/ basin.
- Drip/ trickle.

8. Four disadvantages cambered beds
   - High cost of maintenance
   - Provides breeding ground for vectors of malaria
   - Prevents proper mechanization of the farm
   - Labour intensive

(c) Stage I: Filtration of water intake.
- Water from source river is made to pass through a series of sieves.
- Large particles of impurities are trapped by the sieves.
- Water then enters into the large pipe to be directed to the mixing chamber.

Stage II: Softening of the water.
- Water circulates in the mixing chamber and doses of soda ash to soften the water.

Stage III: Coagulation and sedimentation
- Water is passed through coagulation tank where fresh air enters to remove bad smell/ chloride of lime used.
- Water stays for 36 hours thus solid particles settle and bilharzias causing organisms killed.
- Alum added to coagulated solid particles which settle at the bottom.

Stage IV: Filtration
- Water is passed through filtration tank with layers of sand and gravel to filter it.
- Water leaving the filtration tank is clean.

Stage V: Chlorination
- Water is passed through chlorination tank where chlorine is added.
- Micro-organisms in the water are killed by chlorine.

Stage VI: Storage
- The treated water is stored in large overhead tanks before distribution and use.

9. - Improves soil aeration
   - Raises soil temperature
   - Increases activities of micro- organisms
   - Increases soil volume
   - Prevent accumulation of poisonous substances in the soil

10. - Semi-rotary
    - Hydram
    - Piston/ reciprocating
    - Centrifugal
    - Rotary

11. Four examples of working capital in maize production are;
    - Seeds
    - fertilizer
    - Herbicides
    - Pesticides
    - Fuel fragticides
    - Casual labour (4x ½ = 2mks)

12. four types of water pumps which can be used in the farm
- Centrifugal/rotadynathic pumps
- Piston/reciprocating pump
- Semi-Rotan pump
- Hydram pump

13. four methods of drainage
Open ditches
- Under ground drain pipes
- French drains
- Cambered beds
- Pumping
- Planting of trees/planting of trees such as Eucalyptus

14. A dam is a barrier constructed a cross a river or a dry valley to hold water and raise its level
to form a reservoir or lake
- A weir is a barrier constructed across a river to raise the level of water and still allow water to flow over it

15. - Giving subsidies by reducing the cost of production inputs
Fixes prices of the related products

16. – Piping is the conveyance of water through pipes from one place to the other while pumping is the lifting of water from one point to another by use of mechanical force;

17.
- To facilitate the action of soil living organisms
- To check or reduce leaching
- To moderate or increase soil temperature
- To reduce accumulation of dissolved soil salts
- To reduce erosion rate of top soil
- To improve soil structure
- To increase effectiveness of phosphorous fertilizer and conserve soil nitrogen
- As a way of reclaiming areas such as coastal plains and the river belts which may have high water tables
- In rice fields, water should be controlled by draining the water for a different crop cycle.

18.
- Allowing livestock to graze near water sources often results in organic waste products being washed into the water ways.
- Fertilizer application
- Pesticides
- Over grazing
- Irrigation
- Over cultivation
- Use of farm machinery

19. a) i) A – Drop/ trickle irrigation
ii) B – Sprinkler/ overhead irrigation
b) Two advantages of method A over method B

- Conserves water
- Does not damage flowers, leaves
- Does not cause splash/ splatter irrigation
- Does not encourage spread of fungal diseases from crop to crop
- Does not encourage the growth of weeds all over the field
- Agro- chemical can be dissolved in the water and directly applied to the crop

c) i) Cotton wool
ii) Rough sand

21. four reasons for practicing irrigation
- Increase crop production by applying adequate moisture
- To reclaim dry areas
- To meet moisture requirement of crops
- To produce and benefit from off season crops
- Growing of paddy vice

23. - to prevent rotting
-For processing
- For long storage
- Prevent pest and disease attack

24. (a) Kill germs
(b) For sedimentation

21. S- French drainage T- Vambedred peds M – soil- stones

SOIL FERTILITY 1 (ORGANIC MANURE)

1. two roles of humus in the soil that are beneficial to crops
- Provide nutrients
- Increase water holding capacity
- Increase soil temperature

Neutral soil PH

2. four characteristic of fertile soil (2mks)
- Well drained
- Correct PH
- Good water holding capacity
- Adequate plant nutrients
- Free from pest and diseases
- Correct soil nutrients

3. a) Q-stick√
Function-checking temperature√ and other conditions within the heap
b) i) Top soil-introduces organisms to effect composition√
ii) Wood ash-increases the level of phosphorus and potassium√
iii) Rotten manure-provides food for micro-organism√

4. The illustration below shows a heap system of making compost manure. Study it and answer
the questions that follow.

a) use of arrows indicate how the decomposing material should be transferred from one heap
to another till the manure is applied in the field.
b)- 3 - 6 wks
c) one reason for turning the material in the heap regularly.
- Proper decomposition.
- Facilitate air circulation.
- Microbial activities.
d) two reasons why it is necessary to sprinkle water on the heap.
- To regulate the internal temperatures in the heap.
- Create moist environment for microbial activity.

5. Four indicators of well-decomposed manure
- Absence of bad odour and instead the smell of forest soil
- Light weight
- Brown colour
- Moist but not wet
- - Original nature of material not noticeable (½ x 4pts = 2mks)

6. (a) Two factors that should be considered when siting a compost manure heap are:-
- Accessibility
- Drainage
- Direction of prevailing wind
- Size of the farm/proximity

(b) Five advantages of rotation grazing are: (5mks)
- Livestock with maximum use of pastures
- Reduces build up of parasites and diseases
- Animal waste evenly distributed
- Pasture area given time to regenerate
- Excess pasture conserved
- Possible to apply fertilizer in the parts of the pasture which are not in use (5x1=5mks)

7. It is movement of dissolved nutrients front p soil to lower horizons of soil becoming Unravel able to crops

8.
- Improves soil structure
- Adds nutrients

- Increases cation exchange capacity
- Increases microbial activity in the soil
- Improves water holding capacity/ reduces leaching
- Buffers soil PH

  Moderates soil temperature

9. (a) (i) Preparation of farm yard manure:-
- Collect animal waste/refuse/dung and urine;
- Collect animal bedding/litter and other rotten plant residues;
- Store collected materials under roof/shed to prevent leaching and oxidization of nutrients;
- Turnover the materials regularly;
- Sprinkle water if dry;
- leave the material to rote completely before use; (6x1=6mks)

(ii) Preparation of Hay
- Cut the grass /legume in the field when 50% of it is starting to flower;
- The cut forage is spread in the field for four continuous days (sunny days)
- The cut forage is turned daily for even for four uniform drying;
- Gather the dried material in a central spot;
- Bale the material;
- Properly store the baled hay (6x1=6mks)

(b) Factors to consider in timely planting of annual crops
- Escape from serious weed competition;
- Utilization of early rainfall;
- Exploitation of Nitrogen flush in the soil that has accumulated during dry season;
- Escape from serious pest + disease attack e.g. stalk borer in maize;
- Fetch high market prices when harvested early;
- Reduce competition for labour during labour peak period;
- For harvesting season to coincide with dry period to reduce losses e.g. cotton

  Early planting means early farming/calendar for the farmer to enable him /her to finish up other farm activities; (8x1=8mks)

10. i) A ration containing 18% protein is to be made from maize and sunflower cake. Given that maize contains 7% protein, and sunflower seed cake 34% protein. Use Pearson square methods to calculate the value of feedstuffs to be used to prepare 100kgs of the feed (3mks)

ii) two other methods that can be used to formulate feed ration (2mks)
- Linear programming
- Trial and error

  Graphical method.

AGRICULTURE ECONOMICS

(BASIC CONCEPTS AND FARM RECORDS)

1. (a) - Help to determine the value of the farm/ determine assets and liabilities.
- Provide history of the farm.
- Assist in planning and budgeting in various fields.
- Helps to detect losses or theft in the farm.
- Assists when sharing losses or profits (dividends)for communal owned farms/ partnership.
- Help to settle disputes in the farm among heirs.
- Help to support insurance claim e.g. against fire and theft.
- Provide labour information like terminal benefits, NSSF due, Sacco dues for all employees.
- Help to compare the performance of different enterprises within a farm or other farms.
- Help in the assessment of income tax to avoid over or under taxation.
- Records, helps to show whether the farm business is making profit or losses. This information helps in obtaining credit. (10 x 1 = 10 mks)

2. (a)Health record
(b) Next date of treatment /vaccination
- - Occurrence of the disease
- - Response to treatment (½ x 2 =1mk)

(c) - Select and cull animals on health ground
- Know the course of action to be taken in the event of a disease and maintenance of good health
- Know the prevalent disease
- Calculate cost of treatment

3 Four uses of farm records are;
- Used to compare the performance of different enterprise
- Shows history of the farm
- Help in planning and budgeting of farm operations
- Assessment of income tax
- Calculation of profits and losses
- Securing loans
- Settling disputes where no will is left

4. four uses of farm records
- Help compare performance of different enterprises within the farm and other farms
- Shows the history of the farm
- Guide a farmer in planning and budgeting of farm operations
- Helps to detect losses or theft on the farm

- Helps to avoid over taxation or under taxation
- Helps to determine the value of the farm in terms of assets and liabilities
- Helps in sharing of profits and losses in partnership
- Helps in setting disputes among heirs in absents of a will
- Shows whether the farm business is making profit or losses
- Helps in supporting insurance claims of farm assets
- Provide labour information

5.
- Understanding the technical language used in agriculture
- Application of the right amounts of inputs
- Correct/ appropriate measurements in farming
  Uses of appropriate technology

6. (a) Milk production record (1x1=1mk)
(b) Determine prevalent diseases;
- Establish treatment of diseases;
- Establish disease control method;
- Determine cost of medication/health care;
- Determine the health status of different animals; (4x1=4mks)

(c) Price trends/market situation
- Production techniques
- Labour trends
- Breeds of dairy cattle
- Production constraints/risks and certainties

7.
- Field
- Area of the land
- Season
- Crop planted
- Crop variety
- Land preparation date
- Type of fertilizer at planting
- Type of fertilizer at top dressing
- Seed rate used
- Type of weed and date of weed control
- Type of pest and date of pest control
- Date of harvesting
- Remarks (Any 4)

8. List two events occur during induction stroke in a four stroke engine. (1mk)
- Piston moves down from TDC
- Exhaust valve is closed
- Inlet valve is open
- Air / fuel mixture get into combustion chamber

- Piston reaches BDC. (4x ½ = 2mks)

9. – Where the resources are free
- where there is no alternative
- where the alternatives are very many.