Buramu marking scheme
231/2
BIOLOGY
PAPER 2

MARKING SCHEME

1) a) Presence of more tha two genes determining a trait;
b(i)The gene responsible for black coat colour is dorminant;
2) (ii) BB Bb

B B B b 2BB:2Bb
1:1

BB Bb BB Bb

(iii)Gamete formation;Fertilisation;mutation
3) a) Blood group O is a universal donor as it donates to all other blood groups;
Blood group AB is a universal recipient as they receive blood from blood from all other groups.
Blood group A can receive blood from blood group O and A only.
Blood group B can receive blood from blood group O and B only.
Blood group O does not receive blood from other blood groups except group O.

b) To avoid agglutination/clumping of red blood cells.(1 mark)

c) Blood does not have pathogens. The Rhesus factor matches; (2 marks)

3.

i. Sucrase

ii. Ileum

a. Suitable temperature

Suitable PH

Enzyme co – factors/ co - enzymes

b.

i. Enzyme inhibitor

ii. It attaches to the active of enzymes hence competing with the substrate;/ or it may attach permanently to the enzyme making it not work as it disturbs the structure of the enzyme;

Any 3

4. a) Strong air currents / winds;
High temperatures;
Low humidity/dry conditions ***any 2 pts = 2mks***

Light / Bright light;

b) Absence of leaves/stomata absent;
Transpiration is reduced/ little transpiration; (2mks)

c) Habitat for A: Arid/dry/desert/semi-desert;

s

Habitat for B: Areas of adequate water / high rainfall/ plenty of water;
***Reason**: High rate of water loss / more water lost / A lot of water loss; (2mks)*

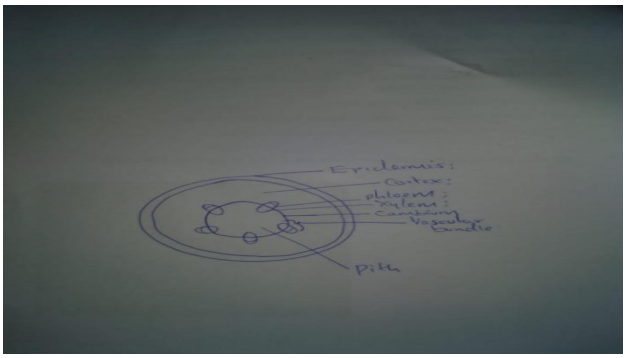
5.

. a) Dicotyledonae;

b) They have broad leaves;

They have network veins;

- Their floral parts are arranged in fours or fives or their multiples;



Drawing …1mk

Correct labels……3mks

6 a) scale 2mks
Curve 1mk
Axis 2mks
Plotting 1mk

(i!) High rainfall is followed a month later by high grasshopper population/low rainfall is followed a month later by low population of grasshoppers;

(b) Presence of large number of grasshopper is associated with large number of crows in the same month; Acc — the reverse. The crows feeding on grasshopper/predating on the grasshopper; if grasshopper population is low the crow population decrease due to migration to other areas in search of alternative food (sources);

(c) (i) grasshoppers — 2nd (trophic) level/ primary consumers;
(ii) crows — 3rd (trophic) level/secondary consumers;
(iii) the grass in the study area — 1st (trophic) level/producers;

(d) (i) Total count;
(ii Capture re-capture;

(e) Vegetation/grass would sprout/increase due to decrease of grasshoppers; The predator would compete for food/grasshoppers with the crows (causing some grasshoppers to migrate) rapidly declining grasshopper population;
f) Maximum number of organism an area/habitat can comfortably support without depletion of the available resources; OWTTE.
(g) Cattle feed on the same type of food/grass (hence high competition food); while wild animals feed on a variety of foods/some are browsers while some are carnivores/; or cattle occupy same ecological nitche; while wild animals occupy different ecological nitches;

7.
1..Diffusion
Waste products ie (Carbon iv) oxide ,oxygenand water vapour.They diffuse out through stomata,cuticle or lenticel of mature plants and epidermis of young plants
2.Exudation
Waste products (exudates)iegum,resins,sap,latexand sometimes nectar.Ereted through pores found on bark of the stem,certain plant plant roots exude sugar,acids,enzymes and polysaccharideinto the soil
3.Deposition
Waste product ie resins caffeine tannin quinine morphinekhat papain are depositedin xylem ,bark,fruit,flowers and leaves .when they age they drop from the plant thereby releasing waste product
4.Guttation
Is the release of fluid from hydathodes mainly from leaves of Angiospermae,aquatic plants and some herbaceous plants growing in moist places.it takes places at night or on humid conditions.Excretes include excess water or sap oozing out inform of water droplet from Margin ot apex of the leaves
5.Re-use/Recycle within the plant
I.ecarbon (carboniv oxide),produced during respirationis used in photosynthesis within same plant.oxygen produced during photosynthesis is used in respirstionwithin same plant

(b) Economic importance of plants excretory products

papain	*A protease used as a meat tenderizer* *Treatment of indigestion*
Caffeine	*Used a mild CNS stimulant*
Pyrethrin	*Natural insecticide*
Quinine	*Anti-malaria drug*
Latex	*Used in rubber industry to make rubber tyres, Shoe soles etc.*
Tannins	*Treatment of leather* *Manufacture of ink and Henna dye*
Gum arabica	*Used in food processing industry i.e. making chewing gums* *Used to culture micro-organisms in biological studies*
Khat	*Used as a mild stimulant/ increase mental activities*
Nicotine	*Manufacture of insecticides*

	Heart and CNS stimulant *Used a s a painkiller*
Cocaine	*Local anaesthesia*
Morphine	*Painkiller and anaesthesia* *Muscle relaxant*
Cannabis	*Used as a pain killer* *Heart treatment*
Heroin	*Used as a narcotic drug*
Colchine	*Induces polyploidy in plants* *Prevents spindle formation in cell division*

C.)

- ✓ *Excess heat stimulates external thermo receptor cells to generate an impulse;*
- ✓ *Impulses are send to the hypothalamus of the brain;*
- ✓ *The hypothalamus also detects overheating in blood reaching the brain*
- ✓ *Motor impulses are relayed from the hypothalamus to effector organs such as ;secretory glands; erectorpillimuscles; superficial blood vessels; liver ;skeletal muscles;*
- ✓ *Effector organs respond by increasing sweating by evaporation of sweat which absorbs latent heat of vaporisation causing a cooling effect;*
- ✓ *Erector Pilli muscles relax to lower skin hair and reduce insulation; this promotes heat loss*
- ✓ *Vasodilation occurs i.e. superficial blood vessels dilate to make blood to flow close to the skin surface; this promotes heat loss by conduction*
- ✓ *Metabolic rates reduces in major body organs such as liver and skeletal muscles; this minimises heat production*
- ✓ *All this processes result in loss of excess heat to maintain optimum body temperature.*

8.

Consists of two oval-shaped testes; lying outside the abdominal cavity in a special sac known as the scrotal sac/scrotum; for protection; the testes are located outside the body to provide a relatively cooler environment/lower temperature; suitable for sperm production; the inside of the testis is divided into seminiferous tubules; these are three coiled and twisted tubules; having rapidly/actively dividing cells that produce sperms; interstitial cells; found between these tubules produce the male sex hormones/androgens (mainly testosterone); important in promoting the development of secondary sexual characteristics; and maintaining masculinity in males; the tubules join together to form the epididymis; which are smaller ducts; that convey sperms out of the testes; they also form a temporary storage area for sperms; the epididymis is connected to the sperm duct/vas deferens; which has thick muscular walls; that contracts to propel sperms to the urethra; the sperm duct is joined by a duct from the seminal vesicle; a blindly ending sac; that produces an alkaline fluid containing nutrients for the spermatozoa/sperm cells; to provide energy; at the junction of the two sperm ducts (one from each testis) and urinary bladder there is the prostate gland; that secretes an alkaline fluid that neutralizes the acidic vaginal fluids; and also activates the sperms; by addition of enzymes and diluting the sperms; below the prostate gland is the cowper's gland; which secretes an alkaline fluid which neutralizes the acidity caused by urine; along the urethra. The urethra; is a long tube running the

length of the penis; used for conduction and expulsion of urine; as well as passage of sperms during copulation; the urethra follows the penis; that projects from the body at the lower abdomen; it consists of a retractable skin known as the prepuce/foreskin; that covers a swollen/bulbous end region of the penis known as the glans; the glans excites the clitoris of the female as it brushes on it during copulation; to stimulate ejaculation/orgasm; the penis is made up of spongy erectile tissue; consisting of numerous small blood spaces, muscle and blood vessels; the spongy tissue gets filled with blood; making the penis to become erect during sexual stimulation excitement and activity; enabling the penis to penetrate the vagina during coitus/copulation/sexual intercourse; in order to deposit sperms (20mks)