

LAIKIPIA EAST TERM 2 2022 FORM 4 EVALUATION EXAM
Kenya Certificate of Secondary Education – K.C.S.E

BIOLOGY
PAPER 2
231/02

MARKING SCHEME

1. a) Oxygen(as a factor necessary for germination)
b) Absorbs oxygen
c) Anaerobic respiration
d) Glucose \longrightarrow Ethanol + Carbon(IV) oxide +Energy

e) Alcohol when in high concentration is poisons to plant tissues;
f) Suitable temperature
Moisture / water
Seed viability
Enzymes
Hormone

2. (a) convergent evolution
(b) Different structures with different embryonic origins are modified to perform similar functions
(c) (i) analogous structures
(ii) Homologous structures
d). divergent evolution/ adaptive radiation

e).	Q.....Insecta;	R.....Aves;	S.....Mammalia
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R- nectar

S- mammary glands, fur

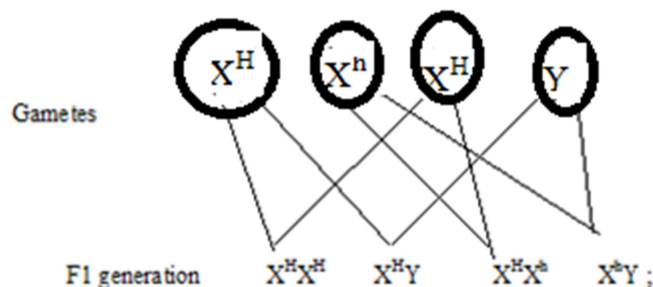
3. a)It's a phenomenon or process whereby fertilization occurs inside the body of a female organism. (1mk)
- b) - Pregnant animals are vulnerable to predators.
- Too demanding to the mother in terms of nutrients.
- Pose health risks to pregnant animals. (2mk)
- c) - Secret the hormone progesterone.
- Medium for gaseous exchange

- Medium for supplying nutrients to the foetus
- Medium for removing waste products from the foetus.

- d) i) Oestrogen- Healing and repair of uterine wall after menstruation.
 - Stimulate the secretion of LH by the pituitary gland.
 ii) Luteinizing hormone- Causes ovulation
 - Stimulate corpus luteum to secrete progesterone hormone
 iii) - Causes graafian follicle to develop from primary follicle
 - Stimulate ovary to secrete oestrogen. (3mks)

4. (a) Animalia Rej Animal
 (b) Centrally located nucleus;
 - Absence of cell wall;
 - Many small vacuoles; (1st 2)
 (c) On the diagram (not elsewhere)
 A – Golgi bodies/apparatus
 B - Cytoplasm
 C - Cell/plasma membrane
 (d) D – Site for protein synthesis;
 E- control activities of the cell
 Store genetic materials

5. a) Gen;
 b) (i) X^hX^h ;
 (ii) Parental genotype X^HX^h X X^HY ;



Phenotypic ratio 3 normal: 1 haemophiliac;

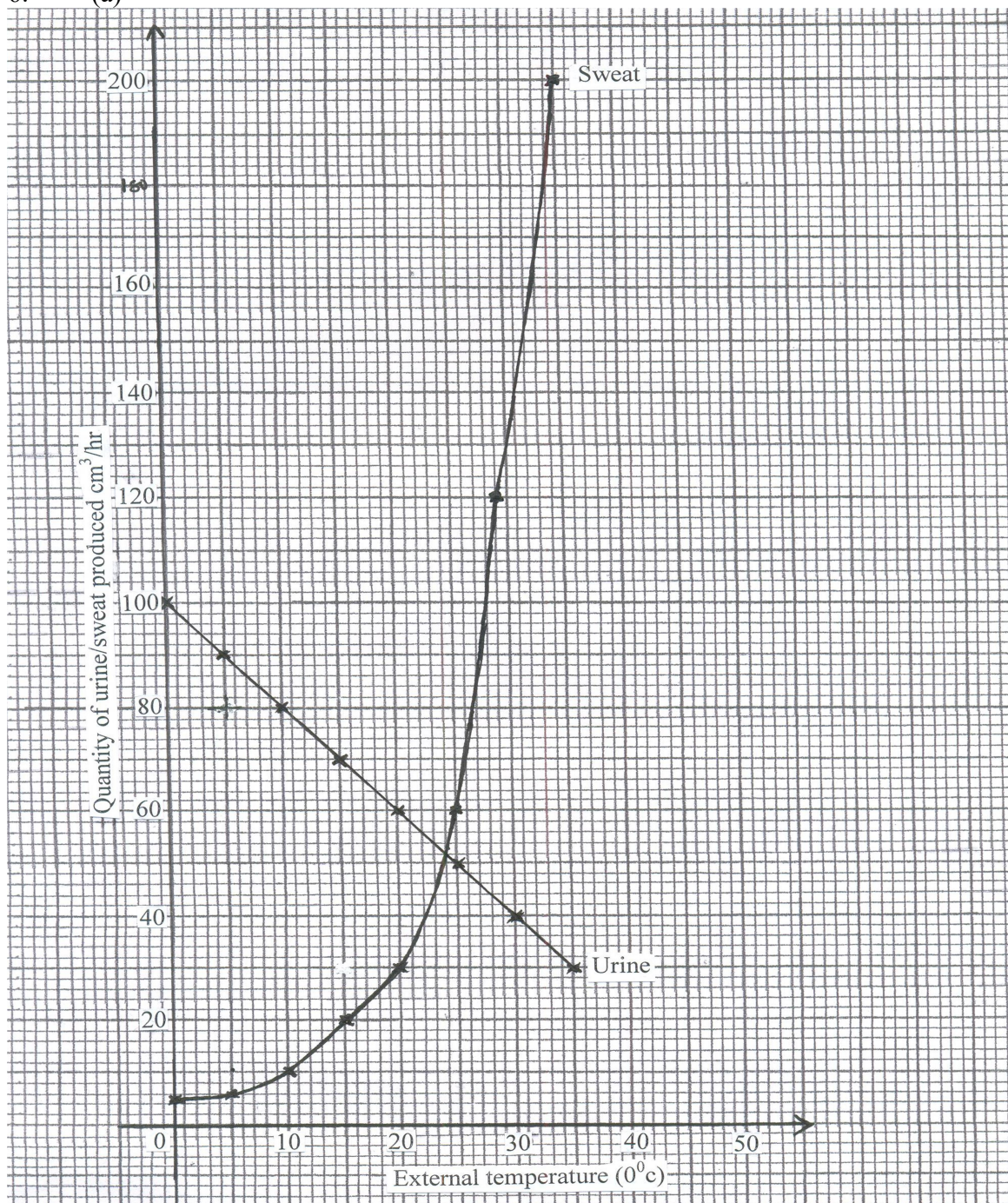
NB-Crossing sign must be present

- Circles must be complete
- Fusion lines should not converge or penetrate the gamete.

Accept use of a Punnett square

- (iii) Males lack corresponding allele on the Y chromosome; therefore they cannot be carriers; OWTTE

6. (a)



(b) 24°C; (1mk)

(c) Sweat production increases with increase in temperature; because high temperatures increase evaporation rate; hence more sweat is converted to vapour; (drawing latent heat from body causing cooling) (3mks)

(d) An increase in temperature decreases amount of urine produced; this is due to increased sweating which raises osmotic pressure of blood; A lot of water is then reabsorbed into the kidney tubules; resulting in production of less urine (3mks)

(e) (i) Cells lining tubules contain numerous mitochondria; to provide energy for active transport,

- Glomerular capillaries have numerous tiny pores for ultrafiltration; (allow small molecular weight substances to pass through and not proteins and blood cells)
- Inner surface of epithelium cells of tubules have numerous micro villi; to increase surface area for reabsorption;
- Tubule well supplied with blood capillaries; for transport
- Proximal and distal tubules are coiled; to reduce speed of flow of filtrate; and increase S.A for reabsorption;
- Thin epithelial lining; for faster passage of substances;

Mark 4 correctly explained answers (max 4 mks)

(ii) Excretion – Elimination of metabolic waste products from body/or separation and removal of metabolic waste products; (1mk)

Egestion – removal of undigested materials from the gut through the anus; (1mk)

7. Herbivores

- Have horny pad (on the upper jaw); against which grass is cut by lower incisors;
- Have long tongue; that turn food/move it for grinding;
- Have diastema; (a gap between front and back teeth) to allow food to be turned

in the mouth;

- Jaws can move side by side; to enable grinding of food;
- Teeth (Molars and premolars) have large cusps; for crushing/grinding vegetation;

10 marks

Carnivores

- Have well developed leg muscles; that facilitate fast movement;
- Have strong jaws and sharp teeth; to grasp their prey;
- Incisors are chisel – shaped; to seize prey/grip/ strip flesh from bones

- Have long/conical/curved canines; to kill/tear flesh;
- have carnassial teeth (that have smooth sides/sharp edges)' to slice through flesh/crush bones;
- Jaws are attached to powerful muscles; that facilitate their up and down movement/grasping prey;

12 marks max 10 mks

8 (20marks]

(b) Immediately after menstruation; the pituitary gland is stimulated to secrete follicle stimulating hormone (FSH); which stimulates the ovary leading to start of development of a new Graafian follicle; its high concentration stimulates follicle cells of the ovary; to secrete oestrogen hormone; Oestrogen hormone brings about healing and repair of uterine wall; and its high concentration stimulates pituitary gland; to secrete Luteinising hormone (LH); LH brings about ovulation; causes the reorganization of remnants of

Graafian follicle into corpus luteum; and stimulates this corpus luteum to secrete progesterone hormone; high concentration of LH inhibits secretion of oestrogen; Progesterone hormone leads to proliferation of uterine in readiness for implantation; When conception occurs, the progesterone hormone maintains pregnancy up to birth; and inhibits production of FSH; If no conception, progesterone level falls drastically leading to menstruation; [max 20 marks]