

**BIOLOGY FORM 3 P2 TERM 3 2023 MARKINGScheme**

1. (a) Guttation: release of water in droplets by plants through hydathodes;  
 Transpiration: loss of water in form of vapour through stomata into the atmosphere. (2mks)
- (b) - Through transpiration minerals ions and water are transported in plants.  
 - cools the plant  
 - removes excess water especially in aquatic plants  
 - responsible for turgor in plants. (any 3) (3mks)

(c)

Arteries	Veins
1. Narrow lumen 2. No valves except at the base of major arteries leaving the heart. 3. Thick muscular walls with more elastic fibres	- Wider lumen - Have valves at intervals - Walls thin less muscular with less elastic fibres

2. (a) gill arch fish gill raker gill filament (3mks on diagram)  
 (b) Gill arch/bar; Gill rakers; gill filament. (3mks on diagram)  
 (c) – long and numerous offering large surface area for maximum gaseous exchange  
 - thin epithelium for respiratory gases to take a short distance by diffusion.  
 - network of blood capillaries to transport respiratory gases.  
 - Moist for dissolution of respiratory gases. (4mks)
3. (a) (i) B - Seta  
 D – Rhizoid  
 (ii) A – produce spores  
 C \_ photosynthesize
- (b) (i) Arthropoda; sp  
 (ii) Segmented body;  
 Jointed appendages rej Limbs /legs  
 Presence of an Exoskeleton;
4. a) Photosynthesis (1mk)  
 b) -Light (energy);  
 -Chlorophyll; (2mks)  
 c) i. Oxygen - used in respiration;  
 - released into the atmosphere (2mks)  
 ii) Glucose - Used in respiration;  
 -converted to starch for storage;  
 -Used in formation of cellulose/constituent of cell sap; (3mks)

5. a) Reflects light through condenser to the stage;  
 b) Moves high power objective lens for longer distance; thus breaking the glass slide/destroying the lens;  
 c) i) (4mks)

Electron	Light
1. higher magnification 2. high resolving power 3. uses a beam of electrons to illuminate the specimen 4. views dead specimen 5. uses electromagnetic lenses	Lower magnification Lower resolving power Uses light to illuminate the specimen Views both live and dead specimens Uses glass lenses

ii) To make the structures clearer/distinct



SECTION B (40 marks)

Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

- 6 A scientist carried out an investigation to find out the population growth of mice under laboratory conditions. Twenty young mice were placed in a cage. The results obtained from the investigation were as shown in the table below.

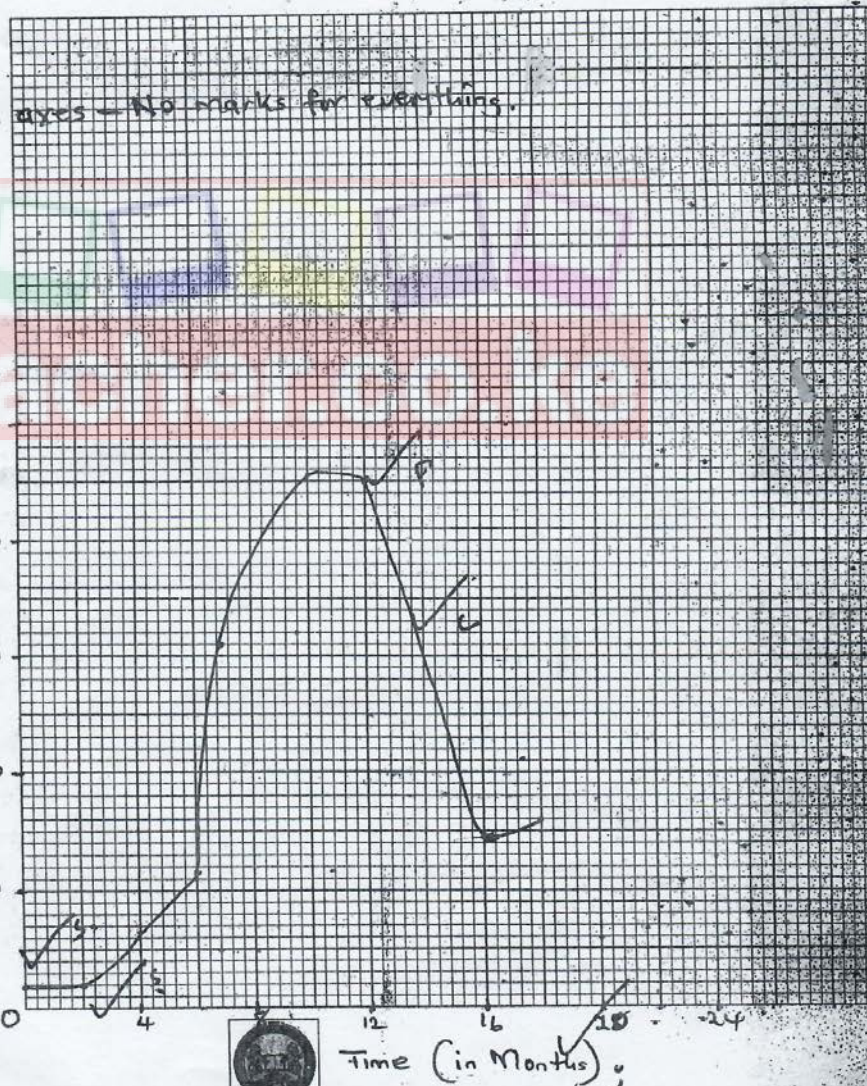
Time in months	0	2	4	6	7	10	12	16	18
Number of mice	20	20	65	115	310	455	450	145	160

- (a) On the grid provided, draw a graph of the number of mice against time. (6 marks)

Reversed axes - No marks for everything.



Number of Mice;



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KNEC 02312002 KCSE

Turn over

**6. i) 0 – 2 months**

No change in population /population is constant;  
Mice still maturing /have not given birth;

**ii) 2 to 6 months**

gradual /slow population growth ; few mice have reached sexual maturity;

**iii. 6 to 10 months**

rapid /faster rate of population growth;  
many mice sexually mature;

**iv) 10 to 12 months**

population decline/decrease;  
competition is high /food limiting/space is limiting  
accumulation of toxic waste/disease outbreak/ death rate is higher than birth rate.

c) (i) 6 and 8;

$$(ii) \frac{(370 \pm 5) - 115}{2} = 125 - 130 \text{ mice per month}$$

d) population would increase

e) food, space/cage size; water; (mark first 2)

7. - Pituitary gland;
- Secretes follicle stimulating hormone;
  - F.S.H causes graafian follicle to develop in ovary;
  - It also stimulate tissue of ovary;
  - To secrete oestrogen;
  - Oestrogen causes repair /healing of uterine wall;
  - Oestrogen stimulates pituitary gland
  - To produce luteinizing hormone;
  - L.H causes ovulation
  - It also causes graffian follicle to change into corpus luteum;
  - L.H stimulates corpus /uteum;
  - To secrete progesterone;
  - Progesterone causes proliferation of uterine wall;
  - In preparation for implantation

- Progesterone /oestrogen inhibits the production of F.S.H
- Thus no more follicles develop ; and oestrogen reduces .
- In the next two weeks progesterone level rises ;
- And inhibits production of L.H' the corpus luteum stops secretion of progesterone;
- And menstruation occur when level of progesterone drops ; (total 21 max 20)

8. a) Diffusion of CO<sub>2</sub>; and oxygen ; through stomata. Lenticels

- deposition /some wastes are stored in tissues in non-toxic form;
- some of these tissues/organs drop off from plants
- some wastes cleansed by transpiration
- other released by guttation
- other released by exudation (total 8 max 4)

- b)
- When body temperature is lowered below normal;
  - blood vessels in skin constrict;
  - blood is diverted to a shunt system;
  - Less blood flows to skin hence less heat lost;

- when body temperature is raised above normal;
- blood vessels in skin dilates;
- more blood flows to the skin;
- more heat lost by convection/ radiation;

erector Pili muscles

- when temperature of body is lowered below normal erector pili muscles contract; hair stands erect; more air is trapped ; air is a bad conductor ; and insulates the body against heat loss
- when body temperature is raised above normal erector pili muscles relax; hair lies on the skin; less air is trapped; more heat is lost;

sweat glands

when body temperature is lowered below normal less fluids are absorbed by sweat glands / less sweating; less vaporization of water;

when body temperature is raised above normal sweat glands are more stimulated / more sweat is produced ; water in the sweat evaporates using latent heat of vapourisation ; cooling body. (total 22 max 16)