

# FORM FOUR END OF SECOND TERM EXAM

Kenya Certificate of Secondary Education

## BIOLOGY

Paper - 231/1

July/August 2018

### Marking Scheme

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- |   |   |
|---|---|
| 1. a) Nucleolus;<br>b) Nuclear membrane; pole acc tonoplast<br>c) Lysosome; 3 marks   | clotting / prevent excessive loss of blood.<br>1 mark   |
| 2. a) Entomology<br>b) Cytology 2 marks   | 8.- Stomata are found on upper epidermis; for efficient gaseous exchange;<br>- presence of large air spaces/ aerenchyma tissues; to enable it float / for buoyance;<br>- presence of large air spaces; for storage of air;<br>4 marks (any two)     |
| 3. a) Carbon (IV) oxide, hydrogen ions /atoms.<br>(2 marks)<br>b) Oxygen gas 1 mark   | 9.a) Rises upwards; and outwards ; 2 marks<br>b) Flattens 1 mark  |
| 4.- thick cuticle<br>- stomata on lower side of the leaf.<br>- fewer stomata<br>- small stomata pore<br>- needle like leaves <b>3 marks</b>   | 10. a) Anaerobic respiration 1 mark<br>b) Plants 1 mark   |
| 5.a) Active transport / diffusion <b>1 mark</b><br>b) Difference between number of molecules on the region of high concentration and the region of low concentration. 2 marks                   | c)<br>- Baking of bread.<br>- brewing of alcohol.<br>- production of biogas and gasohol.<br>- manufacturing of dairy produces.<br>- treatment of sewage.<br>- production of silage.<br>- production of organic products e.g. citric acid.<br>1 mark |
| 6.a) An enzyme is a biological /organic catalyst that speeds up to slows down the rate of biochemical reactions in living organisms.<br>1 mark  | 11. Vitamins; minerals; water; rej cellulose / roughage. 3 marks  |
| b) Temperature<br>- pH<br>- substrate concentration<br>- enzyme concentration<br>- co-factors and co-enzymes.<br>1 mark   | 12.i) Tannins - tanning hides and skin 1 mark<br>ii) colchicine<br>- causes polyploidy<br>- used in treatment of cancer.<br>1 mark  |
| 7.- Thrombosis.<br>- Varicose veins<br>- Arteriosclerosis.<br>- hypertension acc. high blood pressure.<br>- cerebral / vascular /coronary thrombosis.<br>1 mark                                 | iii) Quinine - used as anti-malaria drugs.<br>1 mark  |
| b)- Regulation of body temperature.<br>- Regulation of pH of body fluids.<br>- defences against diseases causing organisms/ pathogens / infection.<br>- prevent excessive bleeding by enhancing |   |

13. a) Stroma 1 mark  
 ii) Provides a large surface area for maximum package of chlorophyll hence photolysis / splitting of water molecule.  
 - Bearing photosynthetic pigments of chlorophyll molecules hence site for light dependent reaction.  
 - where light is trapped for photolysis. 1 mark

14. a) Metaphase I 1 mark

- b) Association of homologous chromosomes  
 - Homologous chromosomes lie side by side/ on the equator of spindle fibres.  
 2 marks

c) P - spindle fibres 1 mark

15. a) Slow down movement of food allowing time for digestion and absorption ; / be able to fit the abdominal cavity; 1 mark

b) To increase surface area for maximum absorption of food;

16. a) Afferent arteriole - A  
 D - Bowman's capsule 2 marks

b) A - wider lumen  
 B - narrow lumen 1 mark

c) Proteins  
 Blood cells 2 marks

17. a) Convergent evolution ; 1 mark

b) Analogous structure;

c) Coccyx;  
 Appendix;  
 Reduced ear muscles / nictating membrane ;  
 Reduced body hair; 2 marks  
*any two*

18.

- a) Have cell wall made of mucin.  
 - Genetic / nuclear material not surrounded by a nuclear membrane hence prokaryotic.  
 - Lack most organelle/ have few organelles / mitochondria absent. 3 marks

b) Insecta rej insect 1 mark

19. a) T - acrosome  
 X - tail 2 marks

- b) It has acrosome with lytic enzymes to dissolve ovum membrane for easier penetration.  
 - It has a long tail to propel the sperm forward side by side lashing action.  
 - Has a large nucleus which carries haploid number of chromosomes to restore diploid state of organism.  
 - Has a large number of mitochondria which provide energy necessary for movement of the sperm. 2 marks

20. a) i) Sensory neurone/ sensory nerve cell  
 1 mark

ii) Cell body is located off the axon / unipolar  
 - have both axon and dendron that are long.  
 1 mark

b) i) Schwann cell 1 mark  
 ii) Secretes the myelin sheath 1 mark

21. a) Change in body form during the life cycle of an organism; 1 mark

b) In the larval stage there is vigorous feeding; hence the insect obtain enough nutrients / food  
 2 marks

22. a) Geotropism

b) Gravity causes downward migration of auxins; causing high concentration of auxins on the lower part of the shoot; this stimulates faster growth on the lower part compared to the upper part; making the shoot to curve upwards;  
 total = 3 marks

23. The surface area to volume ratio is higher in calves than in adults; hence adults retain more heat than the calves hence need to have other ways to lose heat. / the surface area to volume ratio is lower in adults than in calves; hence calves lose more heat than adults.  
 2 marks

b) Elimination of uric acid requires less water than ammonia, hence (more) water is conserved; uric acid is less toxic than ammonia hence safer to excrete where there is less water;

**2 marks**

24. Ability of a seed to retain viability while having restricted metabolic activity; state during which a viable seed cannot germinate when conditions are suitable; 1 mark

b) Abscissic acid; 1 mark

c) Epigeal - Cotyledons, brought ground level; hypocotyl elongates faster.  
Hypogeal - cotyledons remain below ground level. Epicotyls elongates faster.  
2 marks

25. a) Candida albicans 1 mark

b) Treponema pallidum 1 mark

26.

$$P = \frac{fm \times sc}{MR} = \frac{60 \times 72}{10}; 432 \text{ tilapia}$$

(1 mark)