

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education

231/1 -

BIOLOGY

- Paper 1

Nov. 2018 - 2 hours

Name Index Number

Candidate's Signature Date

Instructions to candidates

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- Answer **all** the questions in this question paper.
- All answers must be written in the spaces provided.
- This paper consists of 9 printed pages.**
- Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
- Candidates should answer the questions in English.



For Examiner's Use Only

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	Grand Total				

Answer *all* the questions in the spaces provided.

1. (a) Name the cell organelle found in abundance in the white blood cells. (1 mark)

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- (b) Give a reason for your answer in (a) above. (1 mark)

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2. State **two** observable features that place a millipede into its Class. (2 marks)

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3. Which sets of teeth would be used in chewing sugarcane for maximum extraction of sap? (2 marks)

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4. A group of form two students placed a fresh leaf in warm water. They observed that air bubbles formed on the surface of the leaf.

- (a) What biological process were they investigating? (1 mark)

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- (b) Name the structures from which the air bubbles were coming from. (1 mark)

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- (c) Explain the distribution of the structures named in (b) above on the leaf surfaces of a land plant. (2 marks)

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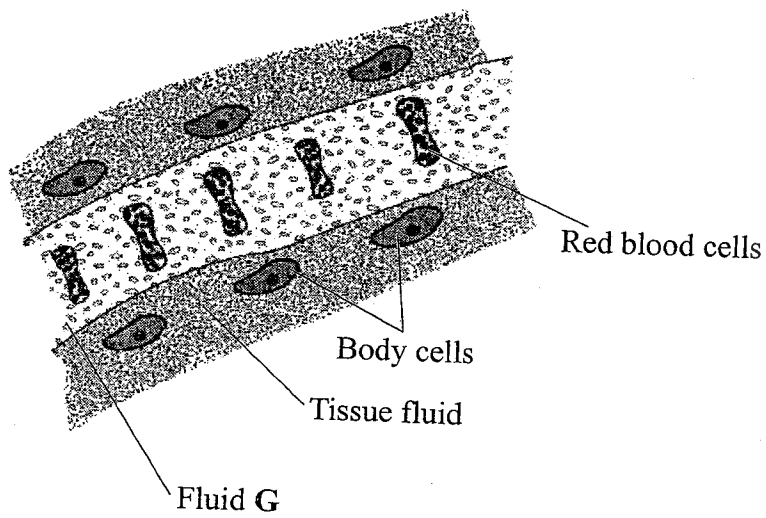
5. State why it is important for plants to lose water to the atmosphere. (3 marks)

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6. The diagram below illustrates tissue fluid and cells surrounding a capillary.



(i) Name fluid G. (1 mark)

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(ii) Give **two** ways by which fluid G is different from tissue fluid. (2 marks)

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7. (a) Define respiration.

(1 mark)

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(b) State **three** activities in the human digestive system that depend on respiration.

(3 marks)

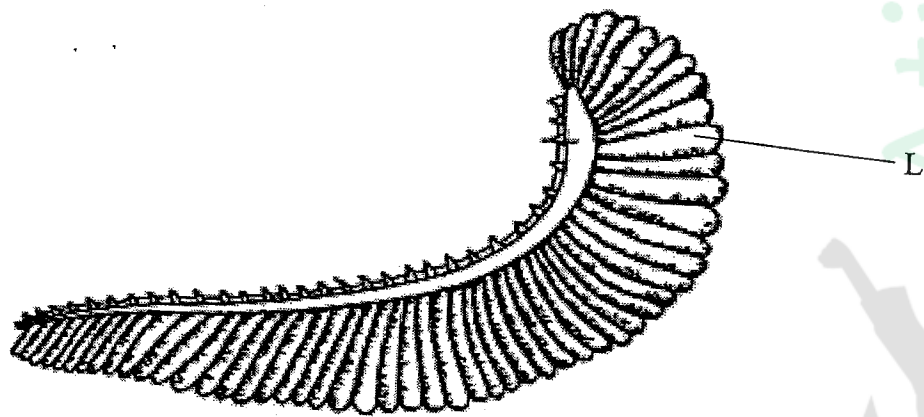
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8. State **three** ways in which blood capillaries are structurally adapted to their functions.

(3 marks)

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9. The diagram below represents an organ in a bony fish.



(a) Name the organ.

(1 mark)

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(b) Describe how air in water reach the capillaries inside structure L.

(3 marks)

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10. Name **two** products of respiration in plants. (2 marks)

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11. (a) State **one** homeostatic role of the human skin. (1 mark)

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(b) Name **three** structures of the skin essential for its homeostatic function. (3 marks)

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12. Explain why the nephron is long and convoluted. (3 marks)

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13. State **two** limitations of using a quadrat to estimate the population of organisms. (2 marks)

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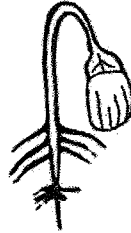


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14. The diagram below illustrates a germinating seedling.



(a) Name the type of germination illustrated in the diagram. (1 mark)

(b) Describe how the type of germination named in (a) above is brought about. (3 marks)

15. Explain why a bony fish dies shortly after being removed from water. (4 marks)

16. Name the bones that articulate to form a ball and socket joint at the hip. (2 marks)

17. Explain the role of carbonic anhydrase in red blood cells. (3 marks)

18. A tall, light skinned lady with pimples on her face has long hair and limbs.

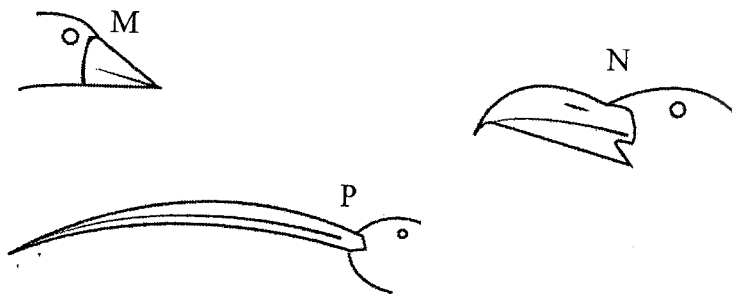
(a) List **two** features which the lady has that are due to inheritance. (2 marks)

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(b) Explain why most recessive genes are expressed phenotypically in male offspring of humans. (3 marks)

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19. The diagrams below illustrate some forms of beaks in birds.



(a) Which diagram represents the beak from which the others are likely to have evolved? (1 mark)

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(b) Explain your answer in (a) above. (3 marks)

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20. (a) Define the term analogous structures. (1 mark)

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(b) Give **two** illustrations of analogous structures in mammals. (2 marks)

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21. State **two** ways in which plants with weak stems obtain mechanical support. (2 marks)

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22. What does the term evolution mean? (1 mark)

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23. State **two** characteristics of living things illustrated in the photograph below. (2 marks)



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24. Explain why a camel has a longer nephron than a whale. (3 marks)

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25. Desert kangaroo rats spend most of their time in underground burrows.

(a) Name this type of behavioural activity (1 mark)

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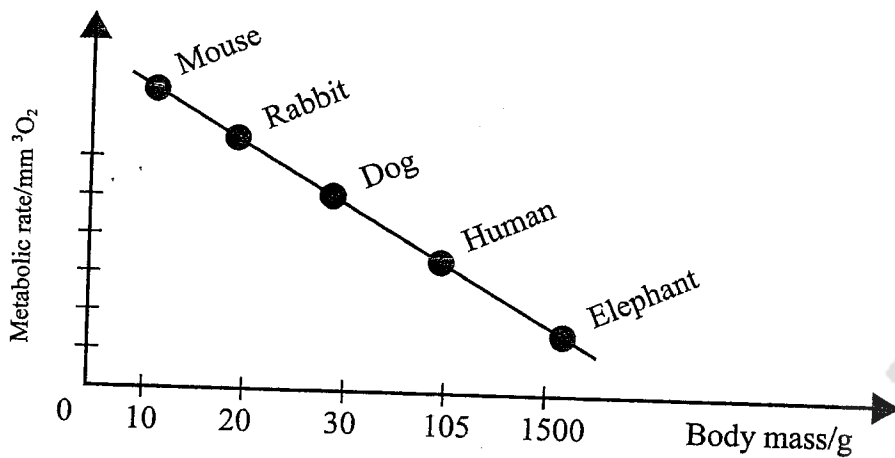
(b) Explain the significance of this behaviour to the organism. (3 marks)

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26. State two advantages terrestrial animals have in excreting urea as their main nitrogenous waste product. (2 marks)

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27. Below is a graphical representation of how basal metabolic rates compare in various animals.



From the graph, explain why the mouse has a higher breathing rate than the elephant. (3 marks)

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