

NAME ..... Index No. ....

Candidate's Signature:..... Date: .....

**231/1**  
**BIOLOGY**  
**PAPER 1**  
**(THEORY)**  
**TIME: 2 hours**

**Keya Certificate of Secondary Education (KCSE)4MCK Joint exam**  
**BIOLOGY**  
**PAPER1**  
**(THEORY)**  
**TIME: 2 hours**

**Instructions to candidates**

- *Write your name and Index number in the spaces provided above*
- *Sign and write the date of the examination in the spaces provided*
- *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*

**For Examiner's Use Only**

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1 - 30	80	

1. As air is pumped into a balloon, the balloon increases in size. What is the difference between this increase in size and that, which is observed in organisms? (1 mark)

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2. Explain why is it necessary to stain specimens for observation under a microscope. (2 marks)

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3. What kind of skeleton is found in the following animals:-

a) Earth worm (1 mark)

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b) Tse tse fly (1 mark)

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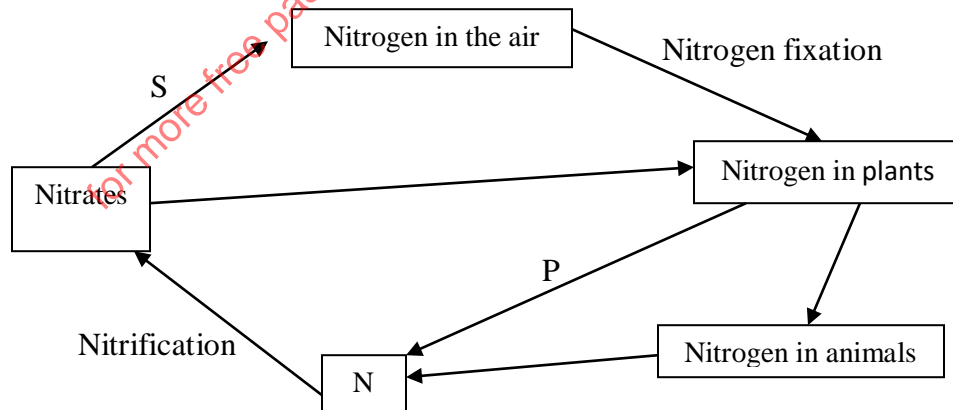
c) Weaver bird (1 mark)

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d) Sea anemone (1 mark)

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4. The diagram below represents the nitrogen cycle.



Name:-

a) The compound N (1 mark)

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b) The process P (1 mark)

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c) The organism involved in process S. (1 mark)

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5. Name the structure in mammalian ear that is responsible for the following functions.

a) Equalizing pressure between the outer and middle ear. (1 mark)

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b) Body balance (1 mark)

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6. a) What is lymph? (1 mark)

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What is the major difference between lymph and tissue fluid. (2 marks)

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7. Differentiate between

i) Cisternae and cristae (2 marks)

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ii) Organelles and organs (2 marks)

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8. In what way is vestigial structures evidence of evolution? (2 marks)

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9. State one antagonistic effect of auxins and gibberellins in plant growth. (1 mark)

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10. Distinguish between haploid and diploid cells. (2 marks)

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11. Explain how osmosis is a type of diffusion. (2 marks)

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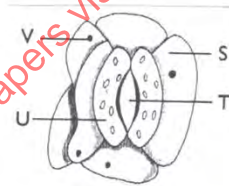
12. Differentiate between poikilotherms and homoiotherms (2 mark)

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13. Name a waterborne disease and state a control measure for it. (1 mark)

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14. a) The diagram below represents a structure observed from a green flowering plant.



i) Name structures labeled S, T, and U on the diagram. (3 marks)

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ii) State the function of the part labeled V. (1 mark)

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15. Name two conditions required for ultra filtration to take place. (2 marks)

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16. Explain the following observations

a) Increase in oxygen concentration in the roots of a plant will lead to increase in mineral ions intake. (2 marks)

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b) Mineral ions uptake decreases once the root hair cells are treated with metabolic poison. (2 marks)

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17. Describe two functions of a cuticle of a leaf. (2 marks)

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18. Blood pressure in the arteries is greater than in the veins of mammals because blood pumped to the arteries by the heart at high pressure. Give another reason. (2 marks)

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19. State two functions of colon in man. (2 marks)

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20. a) Name the reagents one would need to test the presence of the following food substances:-

i) Vitamin C (1 mark)

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ii) Non reducing sugar (1 mark)

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iii) Proteins (1 mark)

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b) Why are monosaccharides described as reducing sugars? (1 mark)

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c) Name a disaccharide that is a reducing sugar. (1 mark)

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21. Why is it important that active transport is employed in the absorption of monosaccharide, dipeptides and amino acids? (2 marks)

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22. Turgor pressure is very important in plants. Give three ways plants make use of turgor (3 marks)

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23. Irritability is the ability of organisms to respond to stimuli.

i) What are stimuli? (1 mark)

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ii) Name two stimuli that plants respond to. (2 marks)

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24. a) When are two organisms considered to belong to the same species? (2 marks)

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b) With reasons, name the kingdom in which paramecium and plasmodium belongs. (2 marks)

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25. Respiratory quotient (RQ) is the ratio of respiratory gases.

a) Write down the formula for calculating RQ. (1 mark)

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b) Write down a balanced chemical equation for aerobic respiration on a glucose molecule. (1 mark)

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c. From your chemical equation, calculate the RQ. (Show your working) (2 marks)

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26. Name any three types of gene mutation. (2 marks)

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27. A student failed to see the field of view through the eye piece of the microscope. Suggest two possible reasons for this. (2 marks)

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28. a) State the processes that take place during anaphase of mitosis. (2 marks)

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b) What is the significance of having the testis outside the body of human male? (2 marks)

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29. The following table shows regions of the gut, their pH and enzymes present.

Complete it. (3 marks)

Region	pH	Enzyme present
	8.5	Lactase
Stomach	2.0	
Mouth		Amylase

30. Why do plants lack elaborate excretory systems? Give three reasons. (3 marks)

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31. Name two plant metabolic wastes. (1 mark)

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