

Name..... Index Number.....

Student's Signature.....

231/1

BIOLOGY

JUNE, 2017

FORM 4

2 HOURS

**MOI HIGH SCHOOL - KABARAK**  
**Kenya Certificate of Secondary Education**  
**BIOLOGY**  
**Paper 1**

**Instructions to candidates**

- Answer **ALL** the questions in the spaces provided.

**For Examiner's Use Only**

<b>QUESTIONS</b>	<b>MAXIMUM SCORE</b>	<b>CANDIDATE'S SCORE</b>
<b>1 - 27</b>		

1. State the meaning of the following terms as used in biology. (2 mark)

(a) Embryology

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(b) Ornithology

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2. (a) Name **two** systems of classification of living things common to Biologists. (2 marks)

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(b) A banana plant was classified as *Musa parasidiaca* by a taxonomist. Identify the taxonomic units represented by the following words. (2 marks)

*Musa* .....

*parasidiaca* .....

3. (a) The cell is the basic structural and functional unit of a cell. State three properties of cell membrane in a living cell. (3 marks)

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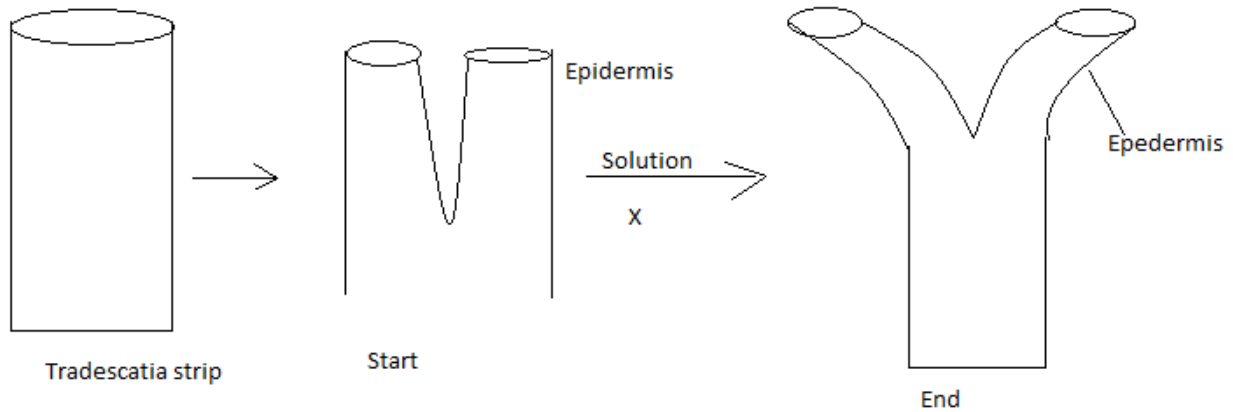
(b) State **two** major functions of centriole in animal cells. (2 marks)

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(c) Name two types of vacuoles in an amoeba cell. (2 marks)

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4. A strip of a herbaceous Tradescantia was cut longitudinally as shown below and placed in solution X. After one hour, the strips appeared as shown below.



(a) What was the nature of solution X? (1 mark)

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(b) What physiological process was being investigated? (1 mark)

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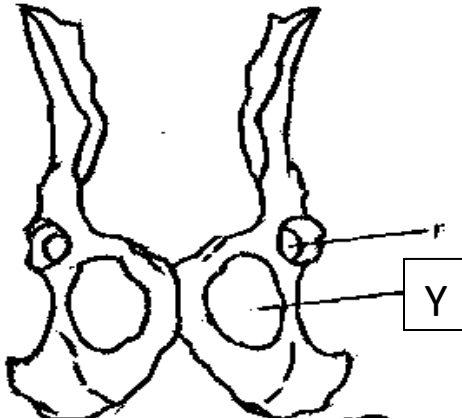
(c) Account for the results at the end of experiment after one hour. (3 marks)

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5. State **two** raw materials required to produce energy in cells for the process of active transport. (2 marks)

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6. The pelvic girdle of a mammal is shown below. Study it and answer the questions that follow.



(a) (i) Name the part labelled Y.

Name : ..... (1 mark)

(ii) State the three functions of part Y named in (a) (i) above. (1 mark)

Functions: .....  
.....  
.....

(3 marks)

7. (a) Name **two** elements required by plants for the synthesis of chlorophyll pigment. (2 marks)

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(b) What name is given to plants whose leaves turn yellow due to lack sunlight and the two elements above? (1 mark)

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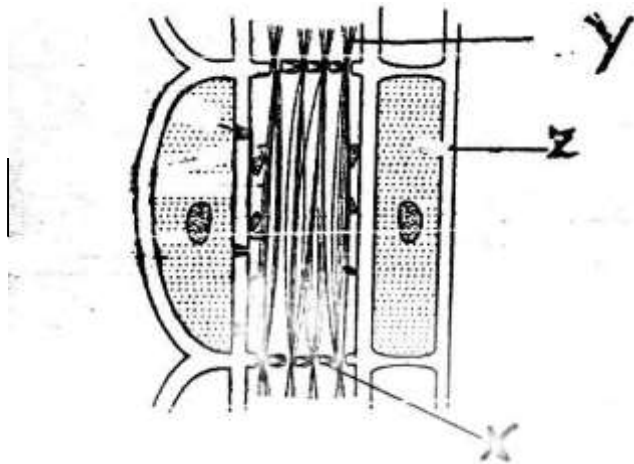
8. Name **two** types of curves obtained during measurement of growth in living things. (2 marks)

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9. State three adaptations of xylem vessels to transportation of water. (3 marks)

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10. The structure below is the phloem tissue.



(a) Name the two main components of the tissue. (2 marks)

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(b) Name the part labelled **Y** and state its function. (2 marks)

W .....

Function: .....

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11. State and explain the role of Heparin in the blood. (2 marks)

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12. State the adaptations of a respiratory surface in terrestrial animals. (3 marks)

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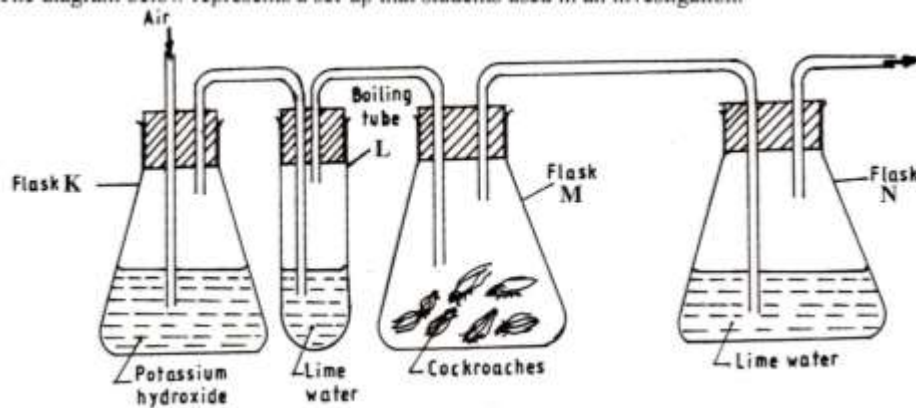
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13. The diagram below illustrates gaseous exchange in animals.



(i) Why was air passed through potassium hydroxide in **flask K**? (1 mark)

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(ii) Explain the observations made in **Flask N**. (2 marks)

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(iii) Why is there no oxygen gas in the air exiting flask N? (2 marks)

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14. (a) Name **three** gaseous exchange surfaces in plants. (3 marks)

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(b) Name the gas released by plants to the atmosphere at night? (1 mark)

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(c) What is the effect of dust on gaseous exchange in terrestrial plants? (1 mark)

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15. Name the major physiological process of respiration that take place;

(a) At the cytoplasm of the mitochondrion. (1 mark)

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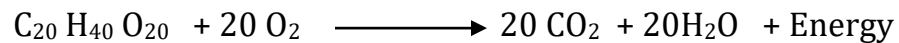
(b) At the matrix of the mitochondrion. (1 mark)

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16. (a) State **two** significance of R.Q values to a biologist. (2 marks)

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(b) The equation below is a respiratory reaction of a certain substrate. Study it and use it to determine its R.Q value. (2 marks)



17. (a) State **two** types of variations in the study of genetics. (2 marks)

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(b) Which of the two types of variations mentioned above is influenced by the genotype of an individual only? (1 mark)

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(c) What is a gene locus in genetics? (1 mark)

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18. (a) Explain the biological reasons behind large volume of urine produced by fresh water Tilapia in Lake Victoria. (2 marks)

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(b) Why do insects and birds produce uric acid and not urea as in man? (2 marks)

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19. Name **two** types of diabetes that inflict man. (2 marks)

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20. State using root structures only how you can identify and group a plant as either a dicotyledonae or monocotyledonae using both morphological and anatomical structures. (2 marks)

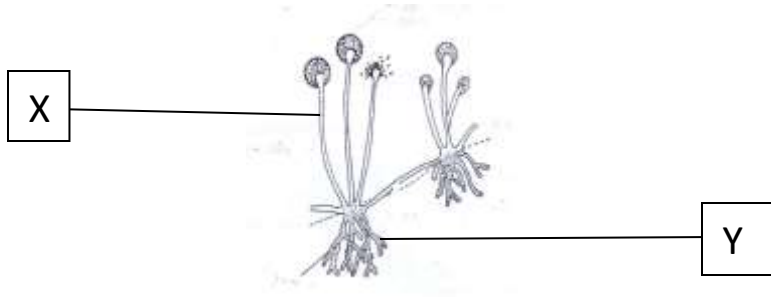
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21. The organism below is found in kingdom Fungi.



(a) Using structures X and Y only, why does the organism not qualify as a plant? (2 marks)

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(b) What division does the moss and liverwort belong to in kingdom plantae? (1 mark)

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22. Name **two** branches of Ecology. (2 marks)

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23. What is a receptor? (1 mark)

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24. State **two** adaptations of each of the following structures to reproduction in animals.

(a) Ovuduct (2 marks)

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(b) Epididymis (2 marks)

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25. State the functions of each of the following cells in the testes. (2 marks)

(a) Sertoli cells

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(b) Interstitial cells

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26. Name **two** bacterial diseases that are sexually transmitted as infections. (2 marks)

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27. Name the chemical substances in plants that; (3 marks)

- (a) Promote ripening of fruits .....
- (b) Flowering in plants .....
- (c) Leaf fall in plants .....