

NAME: ADM NO:.....
INDEX NO.....DATE.....CANDIDATE'S SIGN.....

231/1
BIOLOGY
PAPER 1 (THEORY)
MARCH-APRIL 2017
TIME: 2 HOURS

FORM FOUR JOINT EVALUATION-2017

Kenya Certificate of Secondary Education (K C.S.E)

BIOLOGY
PAPER 1

INSTRUCTIONS TO THE CANDIDATES

- Write your **name, school, index and admission number** in the spaces provided above.
- **Sign** and write the **date** of examination in the spaces provided above.
- Answer **all** the questions in this paper in the **spaces provided** after each question only.
- Candidates should answer the questions in English language.

For Examiner's Use only:-

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1-30	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

1. Why would carboxyhaemoglobin lead to death? (2mks)

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2. An adult elephant flaps their ears twice as much as their calves in order to cool their bodies when it is hot. Explain. (2mks)

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3. Which cell organelle is most abundant in:

- a) Skeletal muscle cells.....(1mk)
- b) Palisade cells.....(1mk)
- c) Salivary gland cells.....(1mk)

4. Explain the role of the following procedures when preparing temporary slides for observation under the microscope:

a) Putting the sections in water on a Petri dish. (1mk)

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b) Staining the sections (1mk)

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c) Cutting very thin sections (1mk)

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5. Define:

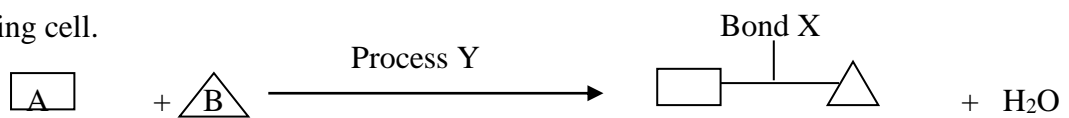
i) Divergent evolution (1mk)

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ii) Convergent evolution (1mk)

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6. Study the diagram below representing the process of a disaccharide build up in a living cell.



a) Name the 2 molecules that could be represented by each letter A and B if the product is similar to that present in sugar cane. (2mk)

A.....B.....

b) Name process Y and X (2mks)

X.....Y.....

7. a) What is sickle cell anaemia (1mk)

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b) State one problem faced by people suffering from sickle cell anaemia. (1mk)

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8. Name the essential parts of a flower (2mks)

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9. Name the antigens that determine blood groups in humans. (1mk)

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10. Some form one students wanted to collect the following animals for study in the laboratory. State the suitable apparatus they should use to collect:

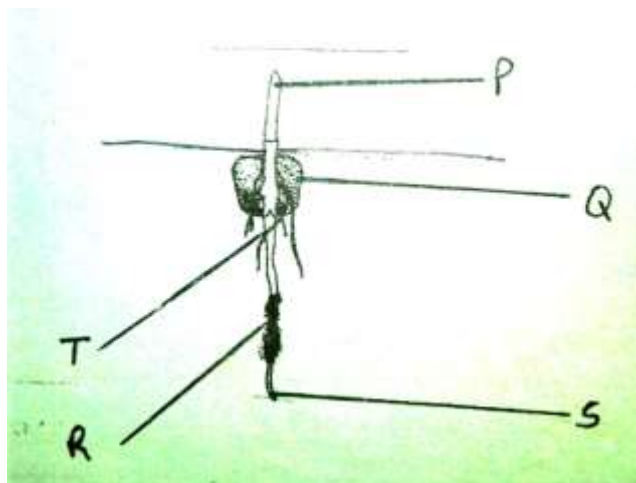
a) Flying insects (1mk)

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b) Small animals from tree backs (1mk)

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11. The diagram below represents a germinating seedling.



a) Name the type of germination exhibited in the diagram above. (1mk)

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b) Name the part labeled P (1mk)

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c) Give one function of part labeled R. (1mk)

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d) Give one characteristic of the cells obtained from the part labeled S (1mk)

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12. State 2 reasons for loss of energy from one trophic level to another in a food chain.

(2mks)

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13. Name the structures in phloem that are involved in translocation of food. (1mk)

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14. Name the hormones responsible for:

a) Osmoregulation.....(1mk)

b) Ionic balance.....(1mk)

15. State 3 characteristics that are special to all guard cells compared to other epidermal cells. (3mks)

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16. Name 2 tissues in plants that provide mechanical support to the plant. (2mks)

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17. A portion of DNA molecule has the following sequence:

G-C-C-T-A-G-A-T-C-A-C

What is the sequence of:

a) The complimentary DNA strand? (1mk)

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b) mRNA copied from the strand indicated above. (1mk)

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18. An Ecologist was observing rhinos feeding in a grassland and noted that ticks and ox-pecker birds were also on the rhino.

Draw a pyramid of numbers to represent the organisms in this food chain that the ecologist observed. (2mks)

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19. Explain why it is important for athletes to train in high altitude area before an important competition. (3mks)

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20. State 3 structural differences between artery and vein

(3mks)

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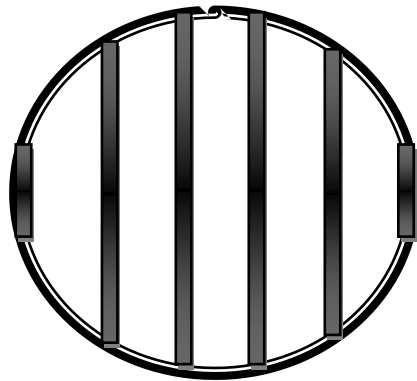
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21. A student estimating the cell size of an onion epidermal cell observed the following on the microscope field of view using a transparent ruler.



The student counted 20 cells along the diameter of field of view.

Calculate the size of one of the cells in micrometers. Show your working clearly.

(3mks)

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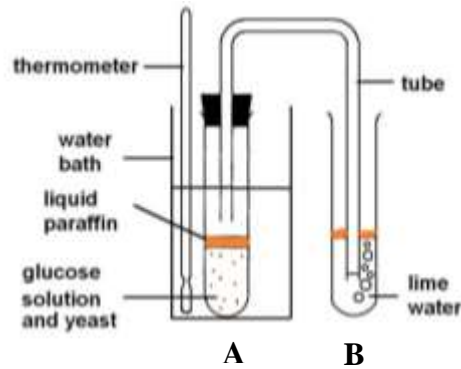
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22. The diagram below represents a set up used to demonstrate a certain physiological process in some cells.



a) State the observations in boiling tube A and B (2mks)

A.....

B.....

b) What gas is produced in this process? (1mk)

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c) Name the physiological process being investigated. (1mk)

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23. What 3 characteristics are used to divide members of phylum arthropoda into classes? (3mks)

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24. The ovaries of an expectant mother can be removed after the first 4 months of pregnancy without terminating the pregnancy. Explain. (2mks)

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25. Identify 4 ways in which HIV/AIDS is transmitted in humans. (4mks)

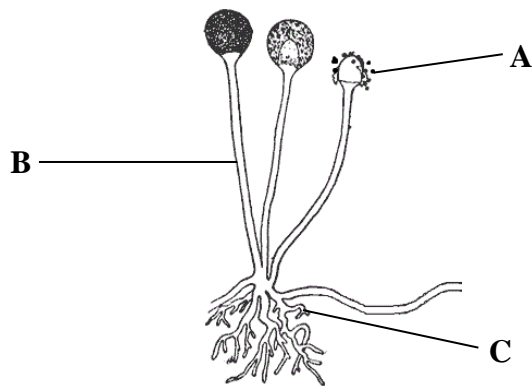
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26. The diagram below represents a mature bread mould (*Rhizopus*).



Name structures A, B and C (3mks)

A.....

B.....

C.....

27. a) Explain what you understand by the following terms.

i) Genotype (1mk)

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ii) Phenotype (1mk)

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iii) Polyploidy (1mk)

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b) State Mendel's first law of genetics/inheritance. (1mk)

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28. a) Define variation (1mk)

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b) Distinguish between continuous and discontinuous variation (2mks)

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29. State the reagents used to test for the presence of non-reducing sugars in a solution. (3mks)

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30. a) State the functions of large intestine

(2mks)

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b) Name 2 components of succus entericus

(2mks)

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