

# PROGRESSIVE BIOLOGY JOINT EXAMINATIONS



## KENYA CERTIFICATE OF SECONDARY EDUCATION - KCSE

231/1

BIOLOGY PAPER 1

JUNE -JULY 2024

TERM 2

TIME: 2 HOURS

NAME..... INDEX NO.....

SCHOOL .....SIGN..... DATE .....

### **Instructions to candidates**

(a) Write your **Name, school and index number** in the spaces provided above.

(b) Sign and write the date in the spaces provided.

(c) Answer **all** questions in the spaces provided.

d) Candidates should answer questions in English.

*Wrong Spelling of Technical Terms shall be penalized*

e) This paper consists of **9** printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

### **For examiners use only**

<b>Questions</b>	<b>Maximum score</b>	<b>Candidate's score</b>
<b>1-27</b>	<b>80</b>	

1. How is support provided for in herbaceous plants? (1mark)

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2. Briefly explain the role of the Pinna in the hearing process. (2 marks)

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3. Using Lamarck's theory, explain why ducks have webbed feet (4 marks)

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4. State two structural differences between a millipede and centipede. (2 marks)

Millepede	Centipede

5. Explain the immediate reaction of the human body bathed in cold water. (2 marks)

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6. (a) State two roles of centrioles in living cells (1mark)

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(b. In a certain part of the gut, large fats are broken down into small fatty acid droplets,

i) Name two salts involved in the process? (1mark)

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ii) State significance of the process above

(1mark)

7. (i) What is a habitat?

(1mark)

(ii) Differentiate between population and a community.

(2marks)

(iii) In a study to estimate population of flies in house, 600 flies were caught and marked. After 24 hrs 400 flies were caught out of which 120 had the marks.

Stating the name of the method of population estimation, Estimate the population size of the flies in that house.

Name.....

(1mark)

Population

(2marks)

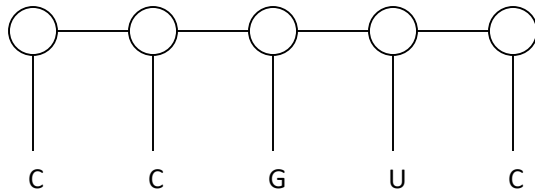
8. a) State three roles of DNA molecule.

(3marks)

(b) Give two causes of variations.

(2marks)

(c) The sequence below is a portion of a nucleic acid



With a reason, identify the nucleic acid to which the portion belongs

(2marks)

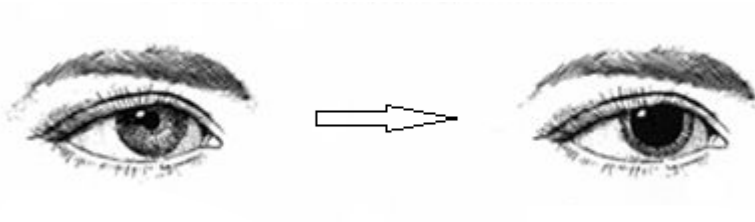
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9. A pregnant woman at 2 months of pregnancy was diagnosed with ovarian cyst and the doctors recommended the removal of the ovary, explain what impact this decision would have on the pregnancy.

(3marks)

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10. The diagram below shows some changes in the external views of the mammalian eye. Study them and answer the question that follows.



a) Name the stimulus that resulted into the change above

(1mark)

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b) Explain the events that led to the change above.

(3marks)

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c) State the retinal adaptations of a cat to its accurate nocturnal vision (2marks)

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11. a) In the Savannah, hyenas have been known to kill and eat lion cubs. With reference to trophic levels, the hyenas in this case may be referred to as (1mark)

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b. What is the role of hyena in above feeding relationship (1mark)

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c. state the causative agent of *Candidiasis* (1mark)

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12. (a) State two adaptations of submerged aquatic plants to photosynthesis. (2marks)

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(b) Explain why primary productivity decreases with an increase in depth in aquatic ecosystem (2marks)

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13. Name the type of response exhibited by:

(a) Movement of termites from dry soil towards moist soil (1mark)

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(b) Tendrils of *Pisum sativum* twinning on another plant (1mark)

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14. (a) State two reasons why the class Insecta in the phylum Arthropoda has the largest number of individuals (2marks)

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15. Give a reason why the shortest food chains are always the most efficient (1mark)

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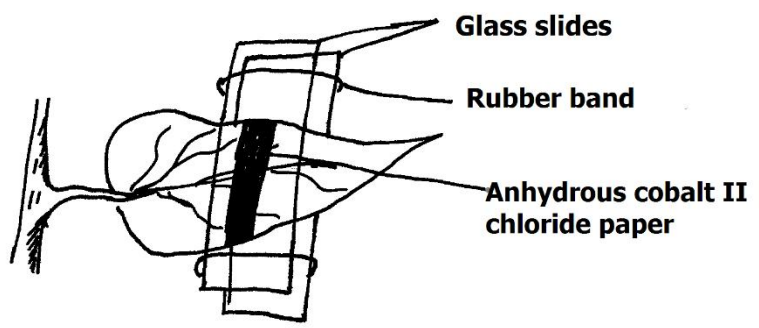
16. Give a reason why the breakdown of pyruvic acid in the mitochondria occurs in a series of enzyme controlled reaction (1mark)

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17. A patient whose pancreatic duct had blocked was found to have normal blood glucose but the process of digestion was impaired. Explain this observation? (2marks)

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18. A teacher set-up the apparatus below to investigate a certain phenomenon. The cobalt (II) chloride paper was placed on the upper and lower surfaces of the leaf as shown.



i) What was the aim of the experiment? (1mark)

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ii) What observations were made after 2hrs? (2marks)

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iii) Explain how increased atmospheric pressure will affect the rate of the process under investigation (2marks)

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19. a) What is sex-linkage (1mark)

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b) Name two traits whose genes located on the Y chromosome (2marks)

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20. Name the organelle that:

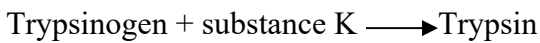
a) Manufacture and transport lipids and steroids in a cell. (1mark)

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b) Contain enzymes that are capable of destroying old damaged cells. (1mark)

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21. The scheme below shows a process that takes place in the human gut.



a) Name substance K (1mark)

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b) In which part of the gut does the process occur. (1mark)

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c) Name the substrate that is acted upon by trypsin and the product formed. (2marks)

**Substrate**.....

**Product**.....

22. State two characteristics that can separate the following organisms into respective classes;

Millipedes, tsetse fly and spider

(2marks)

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23. a) During which stage of meiosis does crossing over occur?

(1mark)

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b) State the significance of crossing over

(1mark)

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24. A mature red blood cell lacks the nucleus and mitochondrion.

(2 marks)

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a) Give a reason for lack of

i) Nucleus

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ii) Mitochondrion

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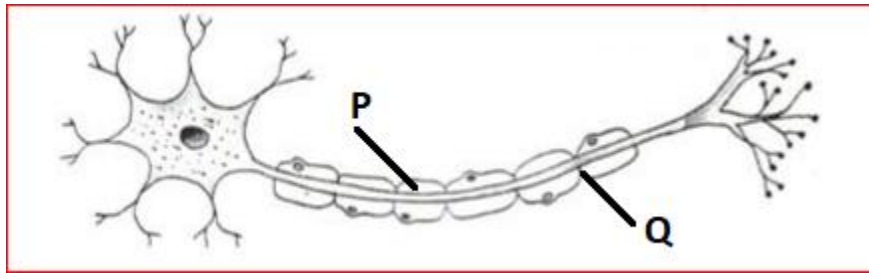
25. State two adaptations of the root hair cells to water absorption

(2marks)

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26. The diagram below shows a type of specialised cell in animals



i) Identify the cell ( 1mark)

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ii) Name the part labelled Q (1mark)

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iii. State the function of the part labelled P (1mark)

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27. a) Explain why there is an increase in blood pH after Anaerobic respiration (2 marks)

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b) Which disease is associated with the pathogen *Bordetella pertussis*. (1 mark)

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c) Name the two respiratory surfaces of a frog. (2 marks)

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