

MASTERCLASS

Kenya Certificate of Secondary Education

FORM 4, PREDICTION II EXAMINATION- 2024

231/1

BIOLOGY

Paper 1

TIME: 2 Hours

Name: **Adm No:**

Class: **Candidate's Signature:** **Date:**//2024

INSTRUCTIONS TO CANDIDATES

1. Write your name and Admn. No. in the spaces above
2. Sign and write the date of examination in the space provided above.
3. This paper consists of 11 printed pages.
4. Candidates should check the question paper to ascertain that all the pages are printed as indicated and **no questions are missing**
5. Answer all the questions

For Examiner's Use Only

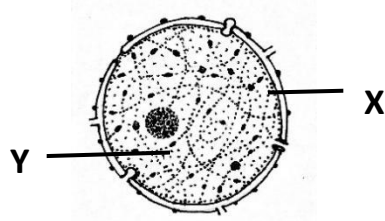
Question	Maximum Score	Candidate's Score
1-25	80	

231/1
Biology Paper 1
THEORY

1. Explain the fact that humans breathe while plants do not. (2 marks)

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2. The diagram shown below represents a common organelle



a) Name a Kingdom that: (2 marks)

i. Has structure X

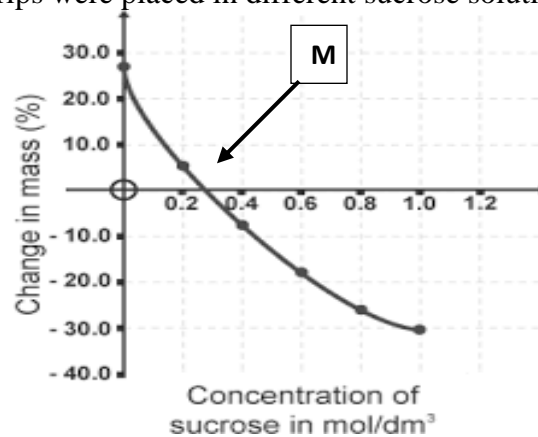
ii. Lacks Structure X

b) How is structure Y important in growth and development of organisms?

(2 marks)

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3. The following is a graph representing results of an investigation on a physiological process when potato strips were placed in different sucrose solutions.



a) Explain why the concentration at M is the normal cell sap concentration of potato cells used in the experiment (2 marks)

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b) Why is there no further change in weight at 1.0mol/dm^3 sucrose concentration? (1 mark)

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c) Give **TWO** conditions necessary for osmosis to take place (2 marks)

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4. In an experiment, Substance **Q** was mixed with iodine solution, and it gave a blue-black color. **Q** was then maintained in a solution containing Enzyme **K** for 15 minutes at 37°C and formed Substance **J** which when boiled with reagent **Z** gave a brick red color.

a) Give the identity of the following: (2 marks)

i) Enzyme **K**

ii) Reagent **Z**

b) i) State **ONE** property of **J** (1 mark)

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ii) Why was the temperature maintained at 37°C ? (1 mark)

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c) Account for the color to be observed when Substance **Q** is reacted with Enzyme **K** in the presence of dilute Hydrochloric acid and Reagent **Z** added?

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(2 marks)

5. a) Name the part of chloroplast where light-independent reactions take place (1mark)

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b) State the importance of light-dependent photosynthetic reactions to:

i) Animals (1mark)

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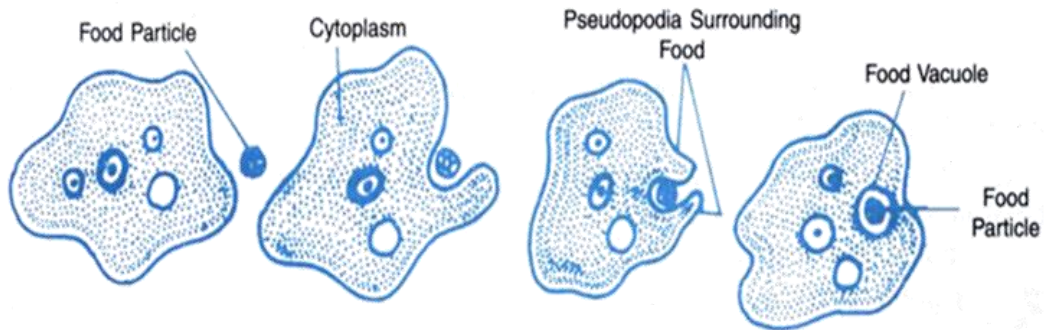
ii) light-independent photosynthesis phase (2 marks)

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6. Explain why the respiration rate of humans is relatively high and constant, while that of plants may vary widely. (2 marks)

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7. The following is a process that takes place in some cells and unicellular organisms



a) Identify the process shown above (1 mark)

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b) Which human white blood cell is capable of the activity named in a) above?

(1mark)

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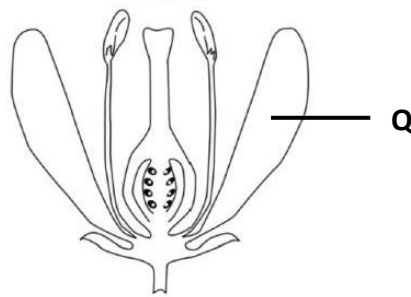
c) Which other way does the white blood cell fight pathogens in addition to the method shown above? (1mark)

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8. Give differences of the endoplasmic reticula in terms of the following features (2 marks)

Feature	Smooth Endoplasmic Reticulum	Rough Endoplasmic Reticulum
Structure		
Function		

9. The following is an illustration of a flower



a) State **TWO** ways part **Q** helps encourage pollination by insects (2 marks)

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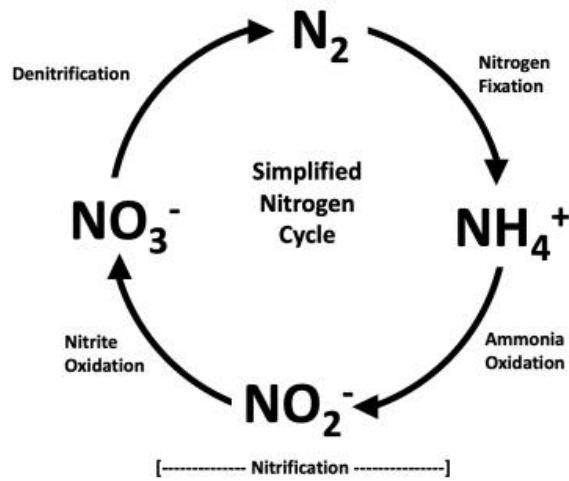
b) Give **TWO** features which promote self-pollination in the flower shown above (2 marks)

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10. Explain how meiosis is involved in the formation of gametes. (2 marks)

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11. The following is a simplified Nitrogen Cycle



a) Explain why denitrification is disadvantageous to plants (1mark)

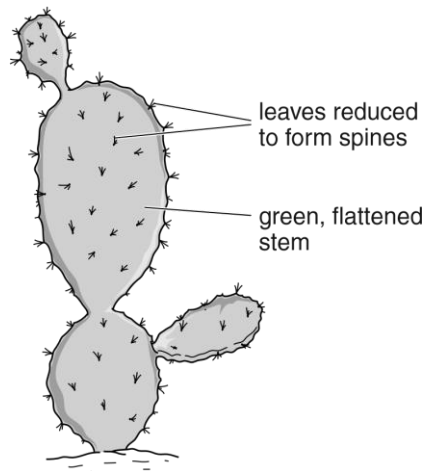
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b) Name the bacteria found at the following stages of the cycle (2 marks)

i) Nitrogen fixation

ii) Nitrification

12. Cacti are plants that grow in desert conditions. The figure below shows a type of cactus.



a) State **two** processes that would normally occur in the leaves of a plant. (2 marks)

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b) Suggest why it is an advantage for a cactus to have leaves with a small surface area. (1 mark)

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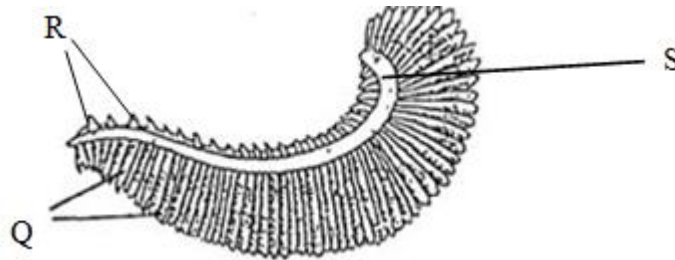
13. a) Name an enzyme that is important in the transport function of red blood cell (1mark)

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b) Give **TWO** adaptations of the red blood cell that arise from its external appearance. (2 marks)

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14. The following is an organ obtained from a freshwater fish



a) State the function of the organ (1mark)

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b) Name the parts labelled **Q** (1mark)

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c) State the importance of parts **R** and **S** to function of part labelled **Q** (2marks)

i) **R**

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.....

ii) **S**

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15. Differentiate between homozygote and heterozygote cells (2 marks)

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16. Use the following images of living organisms to answer the questions that follow



V



W



X

a) Why is it that Organism V belongs to Class Arachnida? (1mark)

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b) Develop a two-stage dichotomous key to identify the organisms above using the following features: (4 marks)

- 1. Wings
- 2. Antennae

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17. a) State **TWO** ways change in body color of a chameleon is important for its survival. (2 marks)

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b) State **TWO** conditions necessary for competition to exist in an ecosystem (2 marks)

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18. State **two** substances found in the urine of a healthy person. (2 marks)

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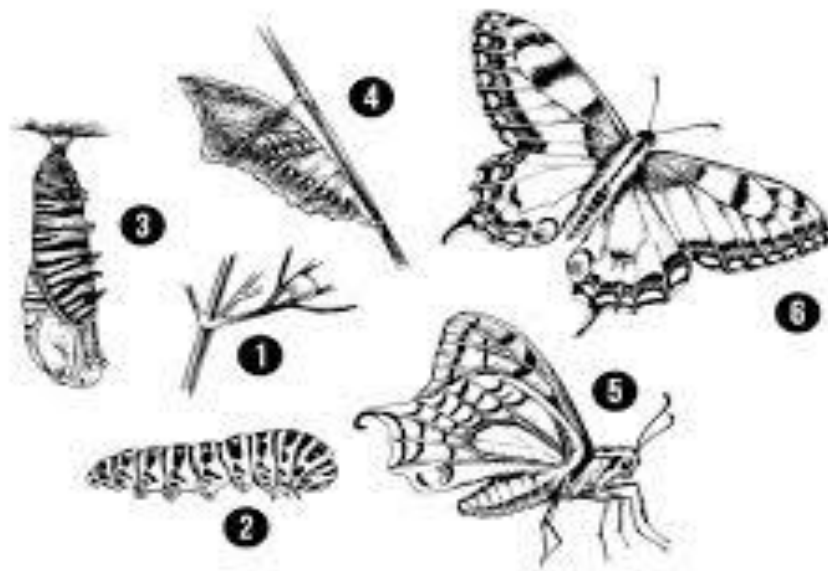
19. a) Name the endocrine tissue found in the Pancreas. (1mark)

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b) Explain the role of the tissue named in a) when sugar level rises above normal (2 marks)

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20. Use the illustration of the development cycle of an insect below to answer questions that follow



a) Name the hormone responsible for the changes observed above (1mark)

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b) Give **TWO** Reasons why stages **2** and **5** occupying different niches is important for the survival of the butterfly. (2 marks)

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21. a) A 60cm long fish was found to measure 25cm from the head to the anus.
Calculate the tail power of the fish (2 marks)

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b) Periodically, fishermen around rivers do observe migration of fish against the water currents to seek freshwater as their breeding grounds. Name the response exhibited by the fish (1mark)

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22. State **THREE** evolutionary features that make human beings to be more developed than the other living organisms (3 marks)

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23. A dwarf garden pea plant was crossed with a tall garden pea plant and all the off springs were tall.

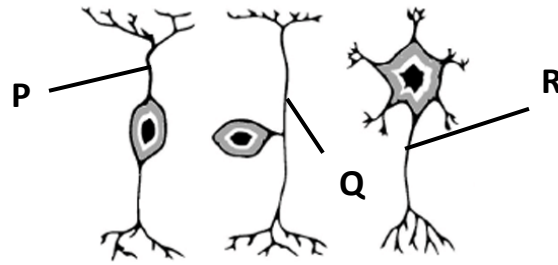
a) Why was there no dwarf offspring? (1 mark)

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b) Write the genotype of the off-springs using letter d for the gene for dwarfness (1mark)

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24. Use the diagrams of nerve cells shown below to answer the questions that follow



- a) Which letter represents a nerve cell that: (2 marks)
- i) Has its cell body outside the grey matter of CNS
 - ii) Transmits impulse to effector muscles
- b) Arrange the letters in sequence to show a reflex arc(1mark)
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25. The following illustration represents a section of the thoracic vertebra



- a) Which letter represents a part that articulates with the rib? (1 mark)
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- b) Give **TWO** functions of part labelled **V** (2 marks)
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