

231/1

BIOLOGY

Time: 2 hours

KCSE 2023 PREDICTION MASTER CYCLE 9

Name Index Number.....

Signature Date

Instructions To Candidates

1. Write your name and class in the spaces provided above.
2. Append your signature and write the date of examination in the spaces provided above.
3. Spelling errors especially of **biological** terms shall be penalized
4. Answer **ALL** questions in the spaces provided.
5. Candidates should answer the questions in English
6. This paper consists of 9 printed pages. Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing

For Examiner's Use Only

Question	Maximum score	Candidate's score
1 - 30	80	

SECTION A

Answer all the questions in this Section in the spaces provided

1. (a) Define the term **mutation**. (1 mark)

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- (b) Give a reason why mutations that occur in gametes are significant. (1 mark)

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- (c) How does translocation occur during chromosome mutation? (1 mark)

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2. Give **three** ways in which atmospheric nitrogen is fixed into nitrates. (3 marks)

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3. What is the effect of relaxation of diaphragm muscles during breathing in mammals? (3 marks)

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4. Explain why the rate of transpiration is high when there is an increase in light intensity. (4 marks)

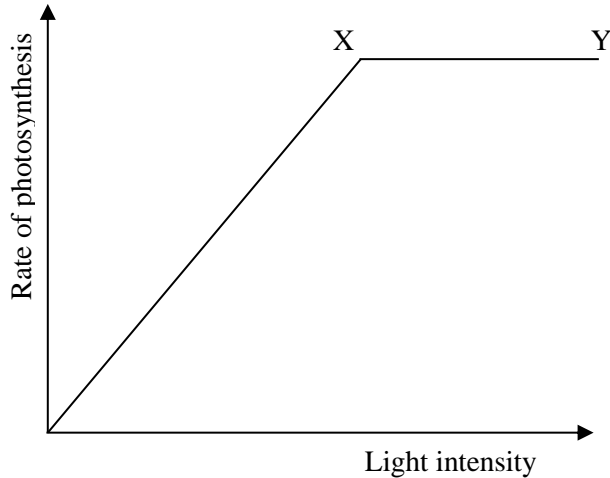
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5. The graph below shows the effect of light intensity on the rate of photosynthesis.



(a) Account for the rate of photosynthesis between X and Y. (2 marks)

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(b) Suggest a change that can be made to the set up to extend the rate of photosynthesis beyond point X. (1 mark)

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6. How do the following antibodies defend the body against disease?

(a) Agglutinins (2 marks)

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(b) Lysins (1 mark)

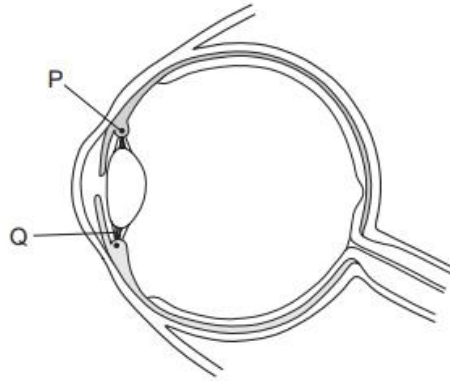
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7. A person hammered a nail two meters from the ground surface in the stem of a ten metres tall tree. Two years later, the tree had growth taller and thicker. Explain where you would expect to find the nail.

(2 marks)

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8. The diagram shows a section through a human eye.



State what happens to P and Q When focusing on a close object at night (2 marks)

P

.....

Q

.....

9. With reference to oxygen and carbon (iv) oxide concentration, state the difference between **inhaled** and **exhaled air**. (2 marks)

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10. Distinguish between **Osmotic Pressure** and **Osmotic Potential**. (2 marks)

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11. Identify **three** events that occur during interphase as a prerequisite for cell division . (3 marks)

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12. The table below shows blood components and how they become modified in the process of urine formation.

Component	Blood plasma g/100cm ³	Glomerular filtrate g/100cm ³	Urine g/100cm ³
Glucose	0.15	0.15	0.00
Proteins	7.89	0.00	0.00
Mineral salts	0.68	0.68	0.50
Urea	0.10	0.10	1.50

State **one** possible reason for each of the following observation.

(i) No protein in the glomerular filtrate.

(1 mark)

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.....

(ii) No glucose in urine.

(1 mark)

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.....

(iii) Increased level of urea in urine.

(1 mark)

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13. Fig. 5.1 shows the marine iguana, *Amblyrhynchus cristatus*



(a) *Marine iguanas* are reptiles. State two features that are used to classify animals as reptiles. (2 marks)

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(b) State two structures that are present in plant cells that are not present in the cells of reptiles. (2 mark)

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14. (a) State the name given to the study of fossils (1 mark)

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(b) Give **two** reasons why the study of fossils is significant. (2 marks)

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15. (i) Identify the mode of feeding of the animal whose dental formula is shown below (1mark)

$$\begin{array}{cccc} \text{I} & \frac{0}{3} & \text{C} & \frac{0}{0} & \text{PM} & \frac{3}{3} & \text{M} & \frac{3}{3} \end{array}$$

(ii) Give reasons for your answer in 7(i) above (2marks)

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16. Explain why there are no blood clots in normal blood vessels? (2 marks)

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17. What do you understand by the term **parthenocarpy**? (1 mark)

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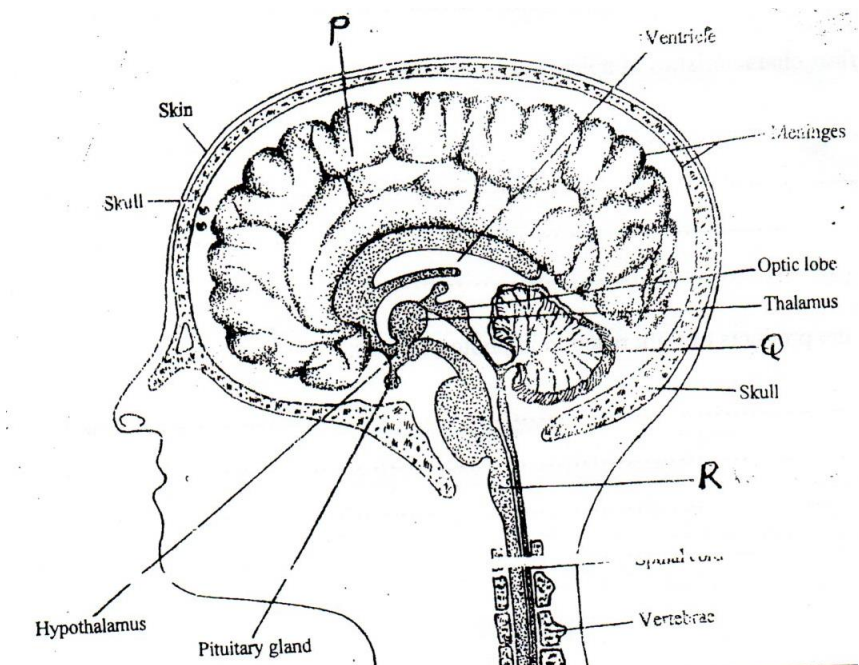
18. What role does the Eustachian tube play in the mammalian ear? (1 mark)

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19. Name **two** substances in plants that are deposited in collenchyma cells that make them effective to provide mechanical support. (2 marks)

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20. The diagram below shows surface view of a human brain.



(a) Name the parts labeled **Q** and **R**. (2 marks)

Q

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R

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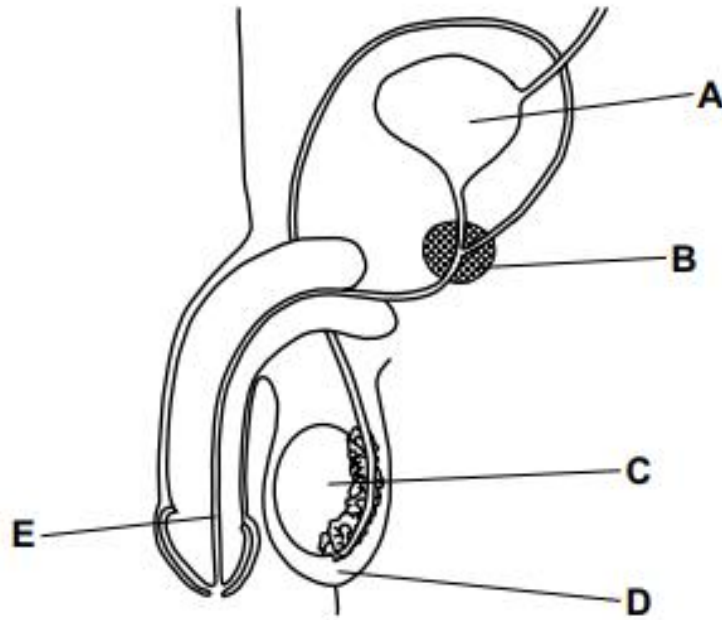
(b) State the function of the parts labeled **R**. (1 mark)

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(c) What would happen to a human being if the part labeled **P** is damaged in an accident.(1 mark)

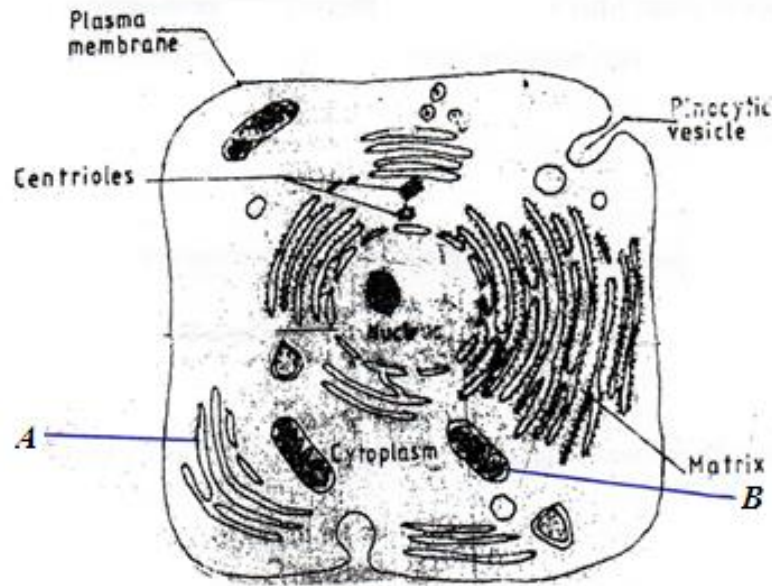
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21. The figure below shows a diagram of part of the male reproductive system.



- (a) State the letter on Fig. 5.1 that identifies: (1 ½ marks)
- i. Where sperm are made
 - ii. The part that carries urine and sperm out of the body
 - iii. Where the fluid that is added to the sperm is made
- (b) Sperm must pass through different structures in the female reproductive system to reach an egg cell. State the names of three of these structures. (1 ½ marks)
- i.
 - ii.
 - iii.
- (c) State **two** ways that sperm are adapted for their function.
- i.
 - ii.

22. The figure below is a fine structure of a generalized animal cell seen through an electron microscope.



(a) Name the parts labeled **A** and **B**. (2 marks)

A

B

(b) How is the structure labeled **B** adapted to its function. (2 marks)

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23. State **two** ways in which skeletal muscle fibres are adapted to their functions. (2 marks)

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24. State **one** similarity and one difference between parasitic and predatory modes of feeding. (2 marks)

Similarity

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Difference

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25. (a) A student was viewing a slide preparation of an onion cell under high power of a microscope. The features of the cell were blurred (not clear). Which part of the microscope should be used to obtain a sharper outline of feature? (1 mark)

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(c) Give the formula used to calculate magnification in a Light Microscope. (1 Mark)

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26. What are the advantages of **Closed Circulatory** system over **Open Circulatory System**.

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27. Name **four** organic bases that are present in a RNA molecule. (1 mark)

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28. The wing of a bat and that of an insect are analogous structures. What kind of evolution is this? (1 mark)
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29. Explain how sunken stomata lower rate of transpiration. (2 marks)
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30. As far as the causes are concerned, state the differences between **Discontinuous** and **Continuous Variations**. (2 marks)
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