



EXAMINATION NO.:  
**THE MALAWI NATIONAL EXAMINATIONS BOARD**

2025 MALAWI SCHOOL CERTIFICATE OF EDUCATION EXAMINATION

# BIOLOGY

Subject Number: M022/I

Wednesday, 2 July

Time Allowed: 2 hours

8:00 – 10:00 am

## PAPER I

### Theory

(100 marks)

#### Instructions:

1. This paper contains 12 printed pages. Please check.
2. Write your Examination Number at the top of each page of this question paper.
3. This paper has two sections, A and B. Answer all the questions in both sections in the spaces provided.
4. The maximum number of marks for each answer is indicated against each question.
5. In the table provided on this page, tick against the question number you have answered.
6. At the end of the examination, hand in your paper to the invigilator when time is called to stop writing.

Question Number	Tick if answered	Do not write in these columns	
1			
2			
3			
4			
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7			
8			
9			
10			
11			
12			
13			
Total			



**Section A (70 marks)**

Answer all the questions in this section in the spaces provided.

1. a. Mention any **two** ways in which nastic responses are important in plants.

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(2 marks)

- b. Explain any **one** factor that affect the rate of transpiration in plants.

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(2 marks)

- c. Mention any **two** common adaptations of both fish and birds to locomotion.

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(2 marks)

2. a. Define the term 'conditioned reflex action'.

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(1 mark)

- b. State any **two** ways in which reflex actions are important.

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(2 marks)

- c. Explain the cause for a reduction in energy that is transferred from secondary consumers to tertiary consumers.

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(2 marks)

- d. Explain **one** way in which size of particles would influence enzyme activity.

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(2 marks)

Continued/...

3. a. Explain any one physical factor of a fresh water ecosystem that would negatively affect aquatic organisms.

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(2 marks)

- b. Figure 1 is a diagram showing part of a mammalian nephron.

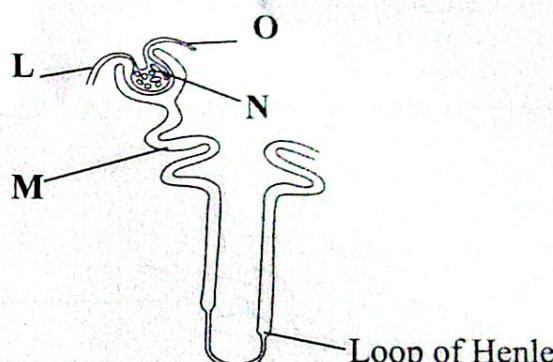


Figure 1

- (i) Name the parts labelled L and M.

L: \_\_\_\_\_ (1 mark)

M: \_\_\_\_\_ (1 mark)

- (ii) Give one structural difference between the structures L and O.

\_\_\_\_\_ (1 mark)

- (iii) Name the process that takes place in the part labelled N.

\_\_\_\_\_ (1 mark)

- c. Explain any one way in which over-secretion of adrenaline by adrenal glands would affect the human body.

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(2 marks)

Continued...

4. a. Explain any one advantage of breast feeding over bottle feeding.

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(2 marks)

- b. Figure 2 is a diagram showing the external structure of the heart.

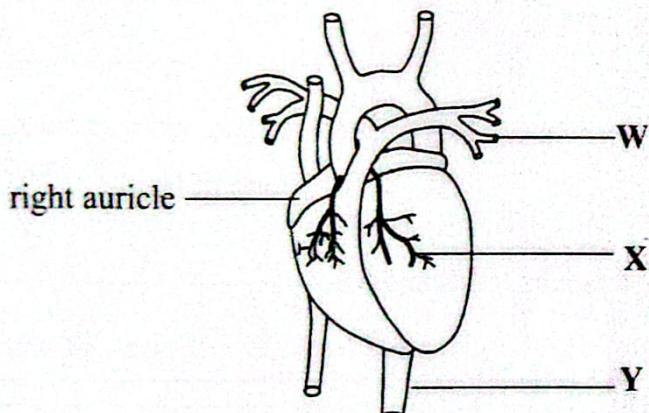


Figure 2

- (i) Name the parts labelled X and Y.

X: \_\_\_\_\_ (1 mark)

Y: \_\_\_\_\_ (1 mark)

- (ii) State any two characteristics of blood carried through W.

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(2 marks)

- (iii) Name the disorder that would arise due to blockage of X.

\_\_\_\_\_ (1 mark)

Continued/...

5. a. State two ways in which vaccination is important to human beings.

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(2 marks)

- b. Explain the role of each of the following cells in immunity.

(i) killer T-cells

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(2 marks)

(ii) helper T-cells

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(2 marks)

- c. Explain one way in which a baby would acquire immunity from its mother after birth.

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(2 marks)

6. a. Mention any one significance of mitosis.

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(1 mark)

- b. Flight in birds involves an upward beat and a downward beat of the wings.

(i) Which one of the two is a recovery stroke?

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(1 mark)

- (ii) Explain the significance of each of the following during downward beat of the wing:

1. spreading of the wing

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(2 marks)

2. overlapping of wing feathers

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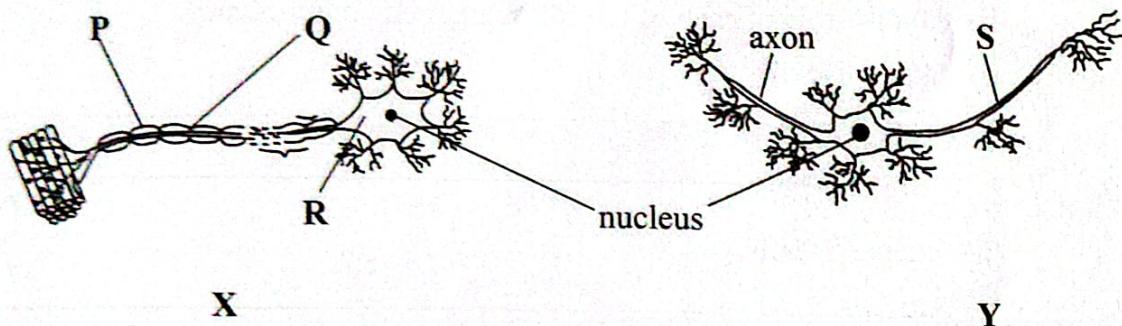
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(2 marks)

Continued/...

7. a. Mention **one** way in which cancer can be prevented.

- b. **Figure 3** are diagrams showing two different types of neurones. (1 mark)



**Figure 3**

- (i) Name the parts labelled **Q** and **R**.

**Q:** \_\_\_\_\_ (1 mark)

**R:** \_\_\_\_\_ (1 mark)

- (ii) Mention the functions of the parts labelled **P** and **S**.

**P:** \_\_\_\_\_

\_\_\_\_\_ (1 mark)

**S:** \_\_\_\_\_

\_\_\_\_\_ (1 mark)

- (iii) State any **one** structural difference between neurones **X** and **Y**.

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\_\_\_\_\_ (1 mark)

Continued/...

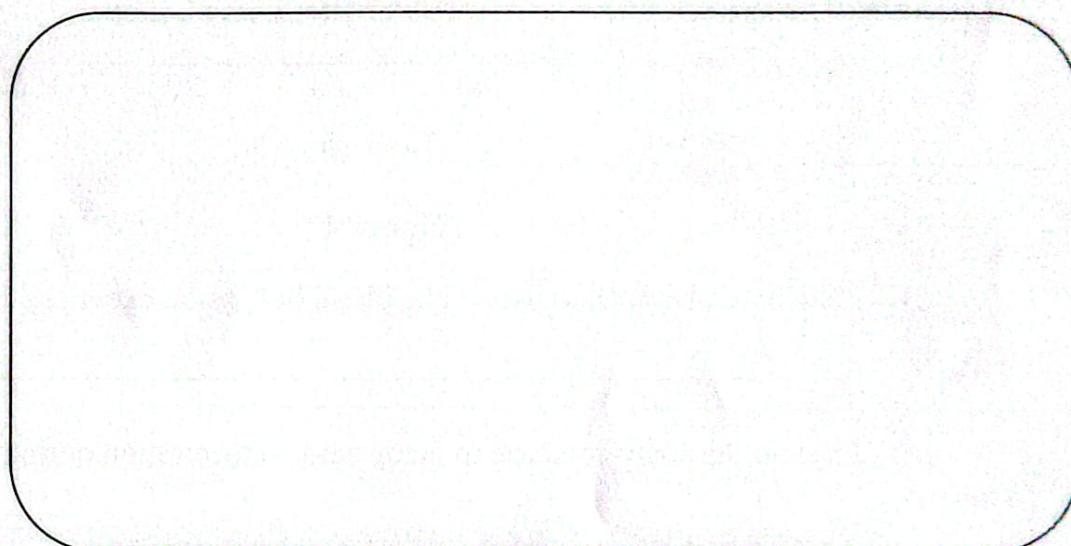
8. a. State any one way in which mutation is beneficial to organisms.

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(1 mark)

- b. Two plants with variegated leaves were crossed, a total of 168 offsprings were produced of which 42 were green, 84 were variegated and the remaining 42 died after a week from the day of germination.
- (i) Using G to represent allele for green colour and W to represent allele for white colour, draw a genetic cross diagram involving the two plants with variegated leaves.



(4 marks)

- (ii) State the phenotype of offsprings that died soon after germination.

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(1 mark)

- (iii) Explain the cause of death in offsprings that died soon after germination.

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(2 marks)

- (iv) Give the genetic term used to describe the behaviour of allele G and W in the cross.

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(1 mark)

Continued/...

9. a. Figure 4 is a graph showing the amount of lactic acid in the blood of an athlete who exercised vigorously for 10 minutes.

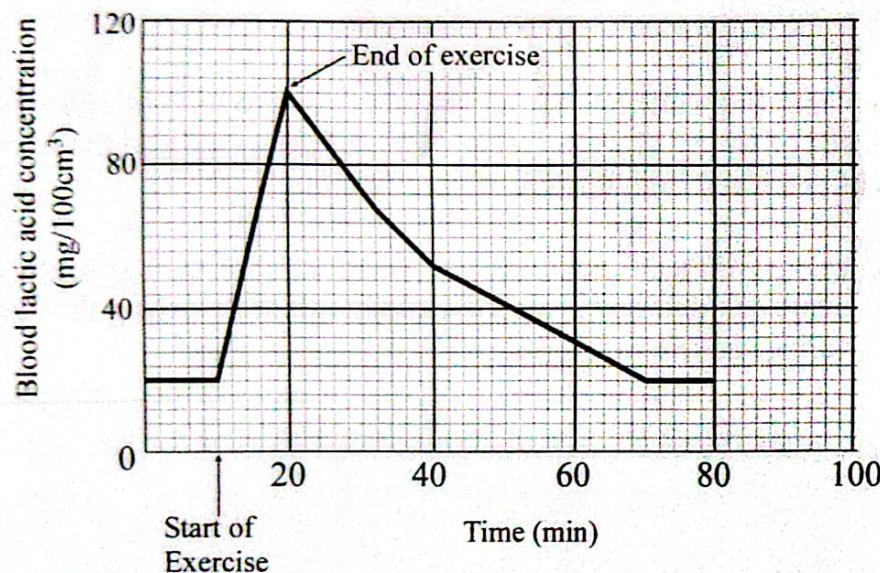


Figure 4

- (i) How much lactic acid was in the blood before the exercise.

(1 mark)

- (ii) Explain the sharp increase in lactic acid concentration during the exercise.

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(2 marks)

- b. Why do athletes breathe fast even soon after an exercise?

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(2 marks)

- c. Explain the effect of unequal distribution of auxin in plant roots.

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(2 marks)

Continued/...

10. a. **Figure 5** is an equation showing a process that occurs in green plants.



**Figure 5**

- (i) Identify the process shown by the equation.

(1 mark)

- (ii) In which internal part of the leaf chloroplast does the process occur.

(1 mark)

- (iii) State any **one** way in which substance **Z** is used by the plant.

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(1 mark)

- b. What happens to hydrogen atoms during the dark stage of photosynthesis?

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(1 mark)

- c. Describe **one** way in which isolation causes speciation in organisms.

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(2 marks)



Continued/...

**Section B (30 marks)**

Answer all the three questions in this section in the spaces provided. Your answers should be in an essay form.

11. Explain any five causes of variations amongst organisms of the same species.

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**(10 marks)****Continued/...**

12. Describe any five ways of preventing abnormal conditions associated with the digestive system.

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(10 marks)

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13. Describe any five adaptations of polar bears to their habitat.

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(10 marks)



**END OF QUESTION PAPER**

**NB:** This paper contains 12 printed pages.