



EXAMINATION NO.: _____

THE MALAWI NATIONAL EXAMINATIONS BOARD

2018 MALAWI SCHOOL CERTIFICATE OF EDUCATION EXAMINATION

BIOLOGY

Subject Number: M022/I

Tuesday, 26 June

Time Allowed: 2 h 30 mins
8:00 – 10:30 am

PAPER I

(100 marks)

Theory

Instructions

1. This paper contains 12 printed pages. Please check.
2. Before you begin, fill in your Examination Number at the top of the question paper and on all other sheets.
3. This paper contains sections A, B and C. Answer all questions in all the sections. Some can be answered quickly, but others require considerable thought and may take longer.
4. Write your answers on the question paper in the spaces provided. 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. You should hand in your question 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			
5			
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12			
13			
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16			

Section A (20 marks)

Answer **all** questions in this section.

1. a. State **two** ways in which transpiration is important.

(2 marks)

- b. Explain how temperature affects the rate of transpiration.

(2 marks)

2. a. **Figure 1** is a diagram showing steps carried out during starch test. Use it to answer the questions that follow:

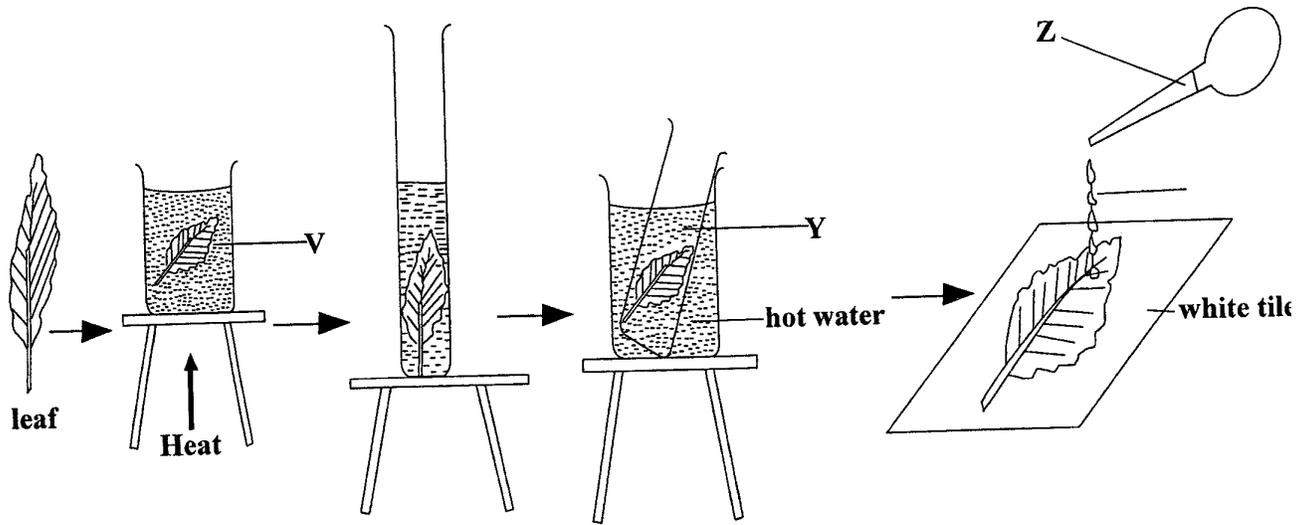


Figure 1

- (i) Identify the liquids **Y** and **Z**.

Y: _____

Z: _____

(2 marks)

Continued

2018

2. a. (Continued)

(ii) Why is the leaf boiled in liquid V?

(1 mark)

b. Explain the result of testing for starch on a leaf that has been put in the dark for 24 hours.

(2 marks)

3. A young man developed a headache, high fever and severe diarrhoea after drinking water from a river. Use this information to answer the questions that follow:

a. Name the disease.

(1 mark)

b. Name the causative agent of the disease named in 3.a.

(1 mark)

c. Give any **one** way of controlling the disease.

(1 mark)

4. a. Give any **two** structural differences between a motor neurone and a sensory neurone.

(2 marks)

b. State the function of each of the following parts of a neurone.

(i) dendrites : _____

(ii) axon: _____

(2 marks)
Continued/...

5. a. Name any **two** excretory organs in the human body.

(2 marks)

b. Give any **two** differences in terms of composition between blood flowing in the dialysis tubing and the dialysis fluid.

BLOOD FLOWING IN THE DIALYSIS TUBING	DIALYSIS FLUID

(2 marks)

Section B (60 marks)

Answer **all** the questions in this section.

6. a. Mention **two** adaptations of the palisade mesophyll layer for photosynthesis.

(2 marks)

b. Describe the process of glucose production during dark stage of photosynthesis.

(3 marks)

Continued/...

7. a. (i) Define the term "organ transplant."

(1 mark)

- (ii) Name any **two** organs in the human body that can be transplanted.

(2 marks)

- b. (i) What problem is likely to occur if organ transplant is carried out without considering blood groups?

(1 mark)

- (ii) Explain **one** way in which the problem in **b(i)** would occur.

(3 marks)

8. The **Table** below shows blood groups of members of a certain family. Use it to answer questions that follow:

Family Members	Type of blood group
Father	B
Mother	A
Son	AB
Daughter	O

- a. (i) Which member cannot donate blood to the family?

_____ **(1 mark)**

- (ii) Explain the problem that would arise if the mother received blood from the member named in **a(i)**.

(2 marks)

Continued/...

8. (Continued)

- b. Give a difference between red blood cells in group B⁺ and those in group B⁻.

(1 mark)

- c. State any **two** ways in which blood of a healthy person defends the body against infections.

(2 marks)

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

(2 marks)

- b. Name the organ in the body that removes excess proteins from the body.

(1 mark)

- c. (i) What happens to the protein before being removed from the body?

(1 mark)

- (ii) Where does the process named in 9.c. (i) occur?

(1 mark)

Continued/...

10. **Figure 2** is a diagram showing the lymphatic system. Use it to answer the questions that follow:

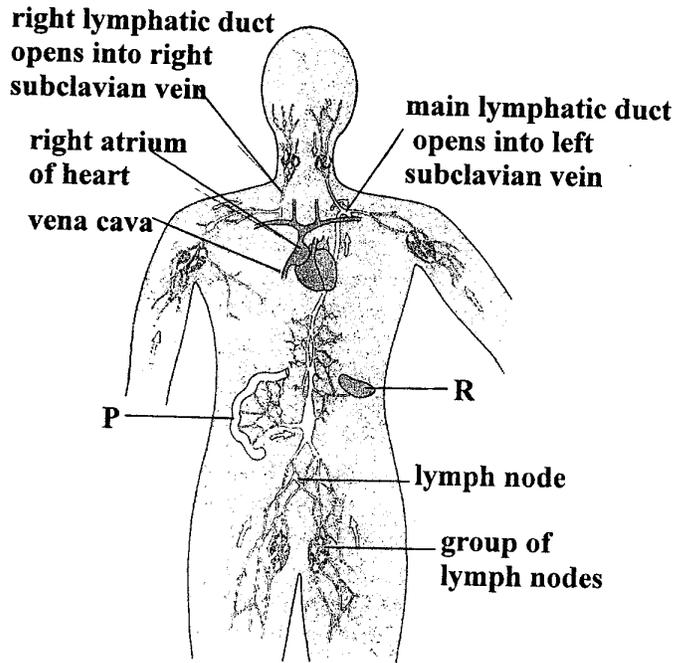


Figure 2

a. (i) Name the part labelled **R**.

_____ (1 mark)

(ii) Name the vessels that carry digested lipids in the part marked **P**.

_____ (1 mark)

b. Give any **two** differences in composition of fluids which flow in venacava and lymphatic vessel.

FLUID FLOWING IN VENACAVA	FLUID FLOWING IN LYPMHATIC VESSEL

(1 mark)

(1 mark)

Continued/...

11. a. (i) State any **two** processes involved in urine formation in kidneys.

- (ii) State any **two** substances contained in urine.

(2 marks)

- b. Which hormone regulates water concentration in the blood?

(1 mark)

12. a. Give the importance of peristalsis in the alimentary canal.

(1 mark)

- b. State any **two** functions of the small intestines.

(2 marks)

- c. Give any **two** functions of hydrochloric acid produced in the human stomach.

(2 marks)

- d. Which vitamins help the body to absorb each of the following?

- (i) calcium

(1 mark)

- (ii) iron

(1 mark)

Continued/...

13. In a breeding experiment, a pure black mouse was crossed with a pure-bred white mouse. All the F_1 offspring were black. Given that the allele for black colour in mice is **A** and that for white colour is **a**.

a. Write the genotypes of the parents:

(i) black mouse

_____ (1 mark)

(ii) white mouse

_____ (1 mark)

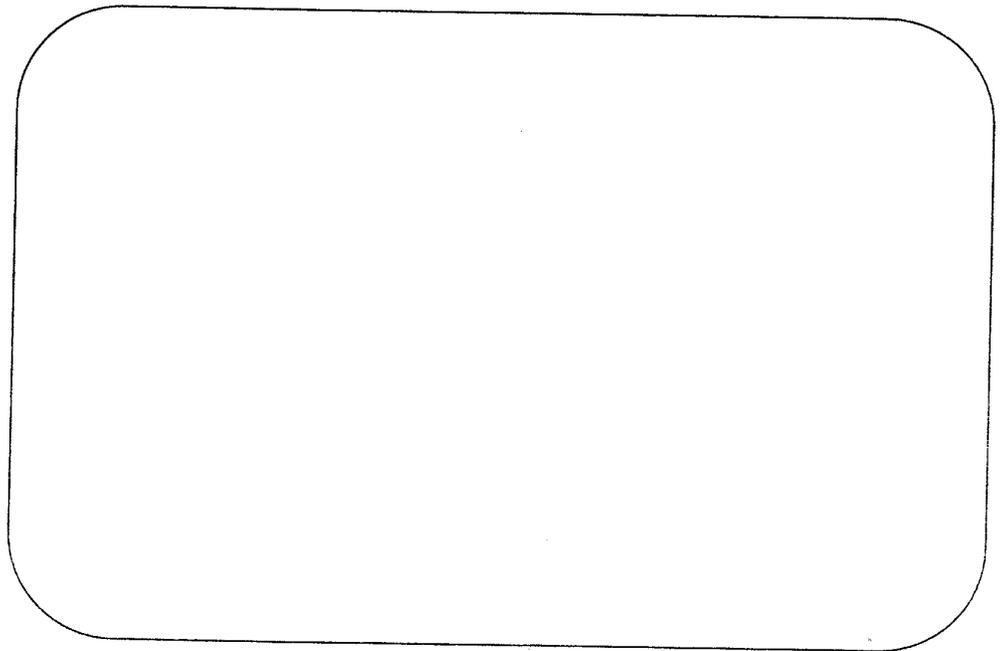
b. (i) Give the genotype of the F_1 generation.

_____ (1 mark)

(ii) State the genetic term that can be used to describe the F_1 offspring.

_____ (1 mark)

c. (i) Using genetic cross diagram, work out the phenotypic ratio of the F_2 offspring.



(6 marks)

Continued/...

13. c. (Continued)

- (ii) If the number of mice produced in F_2 generation were 32.
Calculate the number of white mice produced in the F_2 generation.

(4 marks)

14. Figure 3 are diagrams showing two different types of neurones. Use them to answer questions that follow:

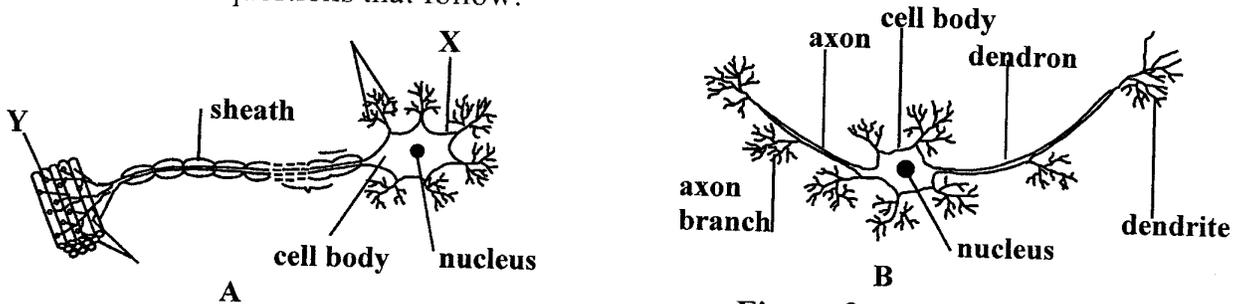


Figure 3

- a. Name parts labelled X and Y.

X: _____ (1 mark)

Y: _____ (1 mark)

- b. Give the function of the dendron.

_____ (1 mark)

- c. State any **two** structural differences between neurones A and B.

_____ (2 marks)

- d. State **two** functions of synapses.

_____ (2 marks)

Continued/...

