

MZUZU CITY CLUSTER EXAMINATIONS
2018 MALAWI SCHOOLCERTIFICATE MOCK EXAMINATIONS

BIOLOGY

Tuesday, 20 March

Subject Number M022/1

10:30am)

Time Allowed 2 h 30 min. (08: 00 –

PAPER 1

100 marks

Theory

Instructions.

1. This paper contains 18 pages. Please check.
2. Before you begin fill in your names at the top of each question paper and on all the 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			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

Section A (20.marks)
Answer all questions in this section

1. How does skeleton perform the following functions?

a. Locomotion

_____ (1 mark)

b. Protection

_____ (1 mark)

2. **Figure 1** shows a response in a seedling which was placed horizontally, use it to answer the questions that follow.

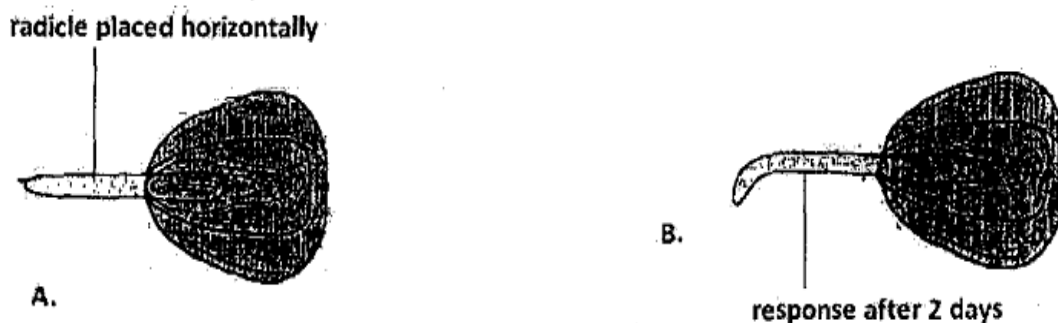


Figure 1

a. What was the stimulus in this experiment

_____ (1 mark)

b.

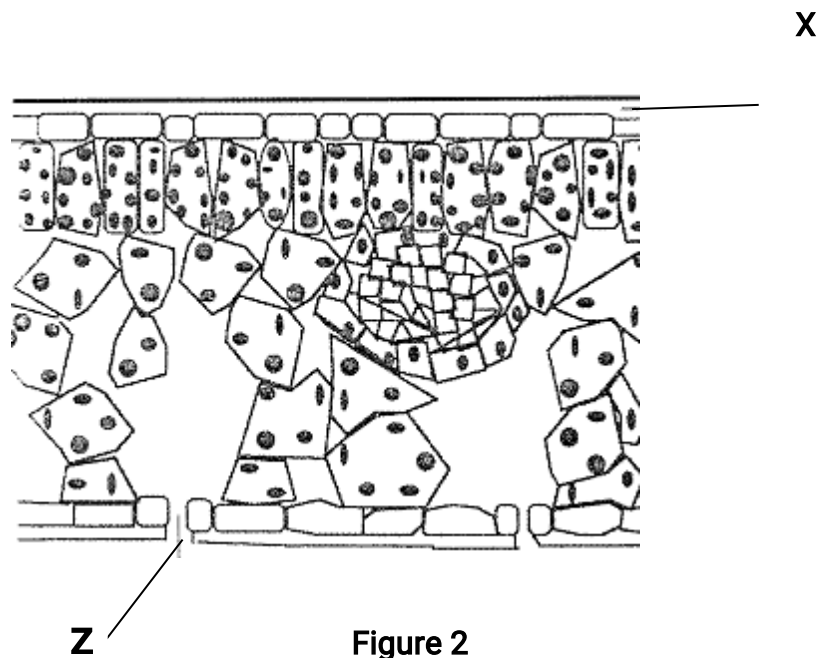
- i. Describe the response in **B**

 _____ (1 mark)

- ii. Explain how the response in **(2b).i.** above was brought about.

 _____ (2 marks)

3. **Figure 2** is a diagram showing a cross section of a leaf. Use it to answer questions that follow:



a.

- i. Name the parts labeled **X** and **Z**

X _____

Z _____ (2 marks)

- ii. What is the function of part marked **Z**

_____ (1 mark)

b.

i. In which area does more photosynthesis occur?

_____ (1 mark)

ii. Give a reason for your answer to **(3b) i.** above

_____ (1 mark)

c. Name the gases that enter through **Z** and state their uses

i. During the day

_____ (1 mark)

ii. During the night

_____ (1 mark)

d. Explain two ways how sunlight energy absorbed by chlorophyll is used during light stage of photosynthesis

_____ (2 marks)

e. State the role of the following mineral elements in photosynthesis

i. Magnesium

_____ (1 mark)

ii. Nitrogen

_____ (1 mark)

4. **Figure 3** shows a stage during cell division. Use it to answer questions that follow:

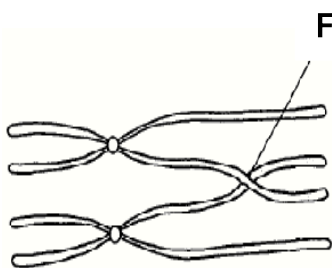


Figure 3

a. Name the type of the cell division shown in the figure

_____ (1 mark)

b.

i. Mention the process taking place at point **F**

_____ (1 mark)

ii. Explain the importance of the process taking place at **F**

_____ (1 mark)

Section B (60 marks)

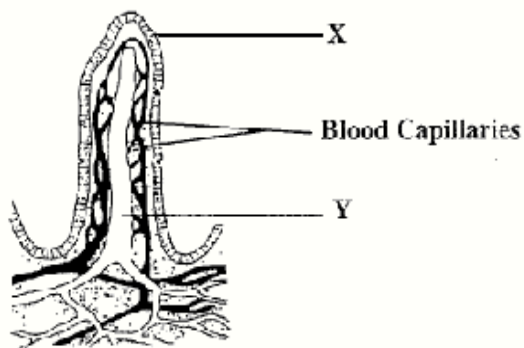
Answer all questions in this section

5. Study **Figure 4** showing a structure found inside the ileum and answer questions that follow.

Figure 4

- a. What is the name given to the structure shown above? _____ (1 mark)

- b. Name
labelled X
Y



parts
and

X.

_____ (1 mark)

Y _____ (1 mark)

- c. What is the use of this structure in the intestine?

_____ (1 mark)

- d. Explain **one** adaptation of this structure that enable it perform its functions effectively.

(1 mark)

e. Where is water absorbed along the alimentary canal?

(1 mark)

6. **Figure 5** is a diagram showing levels of oestrogen, progesterone and follicle stimulating hormones (FSH) in blood and events leading to menstruation and ovulation in a human female.

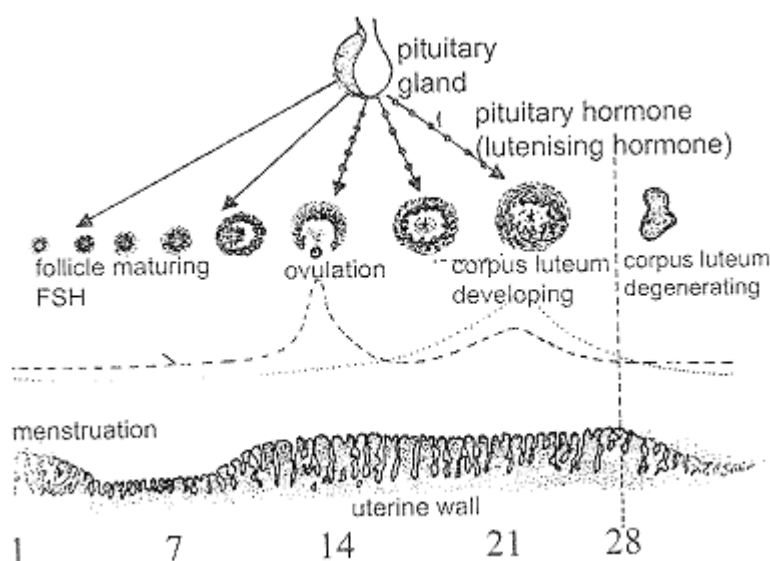


Figure 5

a. What happens to the development of follicles when the following changes occur:

i. Oestrogen level increases?

(1 mark)

ii. Follicle stimulating hormone is at its lowest level?

(1 mark)

b. State the role of the following:

i. Corpus Luteum

_____ (1 mark)

ii. Luteinising hormone

_____ (1 mark)

c. Mention two places where progesterone is produced

i. _____

ii. _____ (2 marks)

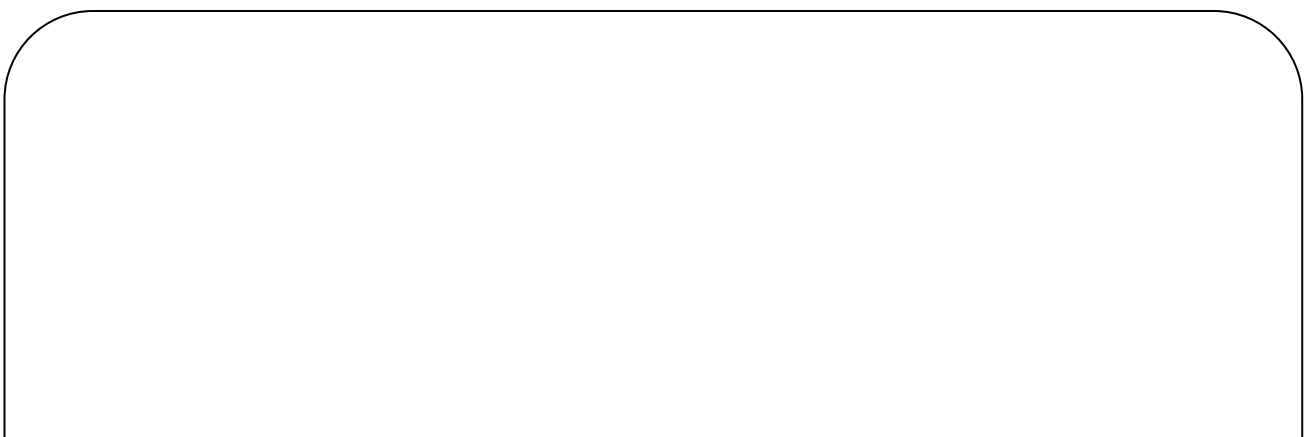
d. Which blood vessel carries Oxygen and food nutrients from the mother to the embryo?

_____ (1 mark)

7.

a. Four students were estimating the population of butterflies in the football ground.

They found **200** butterflies which were marked and released. After **3** hours he caught **150** butterflies in the same area of which **50** had a mark. Calculate the population of butterflies.



(3 marks)

- b. State two ways in which the population size of butterflies can be controlled using biological methods.

i. _____

ii. _____ (2 marks)

- c. How can you estimate population of small plants and slow moving organisms?

_____ (1 marks)

8. **Figure 6** is a set up of a woody stem used by students to investigate translocation in a plant.

Use it to answer questions that follow:

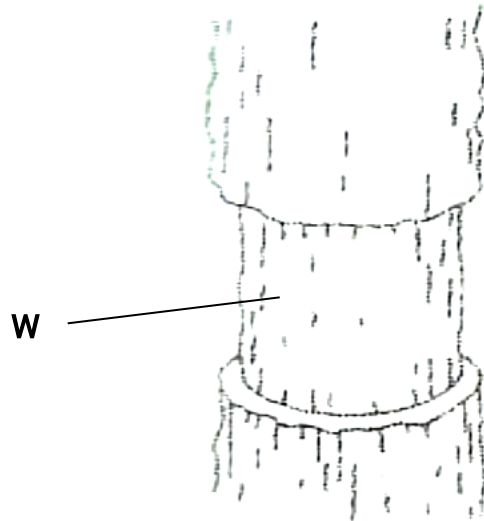


Figure 6

a.

i. Name the experiment shown by **Figure 6** above

_____ (1 mark)

ii. Name the substance that pass through **W**

_____ (1 mark)

b.

i. Draw the diagram showing results of the experiment after 3 months

A large, empty rounded rectangle with a thin black border, intended for the student to draw the results of the experiment after 3 months.

(1 mark)

- ii. Explain the results for your answer to **(8b) 1.** above.

(2 marks)

- c. Explain how the following factors affect the following factors affect the rate of transpiration

- i. Water supply

(1 mark)

- ii. Temperature

(1 mark)

9.

a. Define the following biological terms

i. Evolution

_____ (1 mark)

ii. Speciation

_____ (1 mark)

b. State any **two** evidences in support of the theory of evolution

i. _____

ii. _____ (2 marks)

c. **Figure 7** is the diagram showing the evolutionally fossil record of theoretical organisms **P, Q, R, S** and **T**, the width of each band indicated the relative abundance of the organisms at the time, Use the diagram to answer the questions that follow.

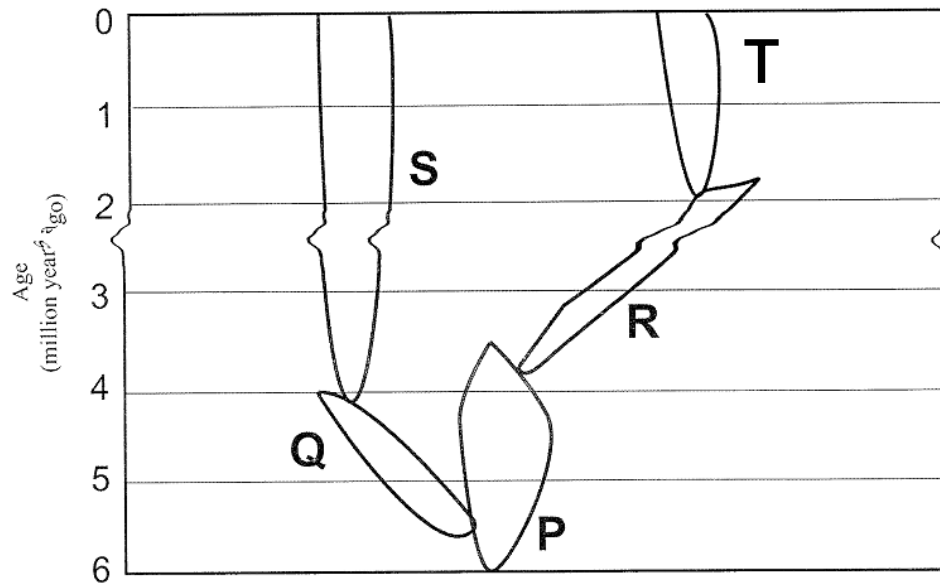
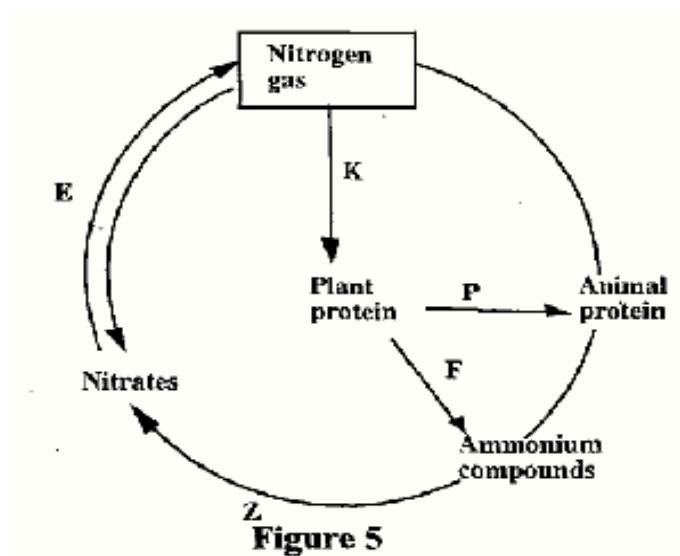


Figure 7

- i. Which letter stands for the oldest group of organism
 _____ (1 mark)
- ii. Which organism are still in the existence
 _____ (1 mark)
- iii. About when did organisms Q and T evolve
 Q _____
 T _____ (2 marks)
- iv. Which organisms are more abundant today
 _____ (1 mark)

10. **Figure 8** shows one of the nutrient cycles in nature. Use it to answer the questions that follow.

- a. Name the processes taking place at **F** and **P**.



F _____

P _____ (2 marks)

- b. Explain how the process at **K** takes place.

_____(1 marks)

- c. Under what conditions does the process at **E** take place?

_____(1 mark)

11. A dialysis machine is an artificial kidney which is used when a person has kidney failure

- a. How is the loss of glucose and other substances from the blood prevented when a patient is on dialysis machine

_____(1 mark)

- b. State one similarity between the dialysis tube and the tubule of nephron

_____(1 mark)

- c. Name two substances that diffuse out of the dialysis tube when it is in operation

_____(1 mark)

12.

- a. Explain how smoking can cause cancer

_____(1 mark)

- b. State **one** properties of effective and efficient gaseous exchange surfaces

(1 mark)

- c. **Figure 9** is a graph showing changes in the volume of air breathed by the person soon after exercise. Use it to answer questions that follow

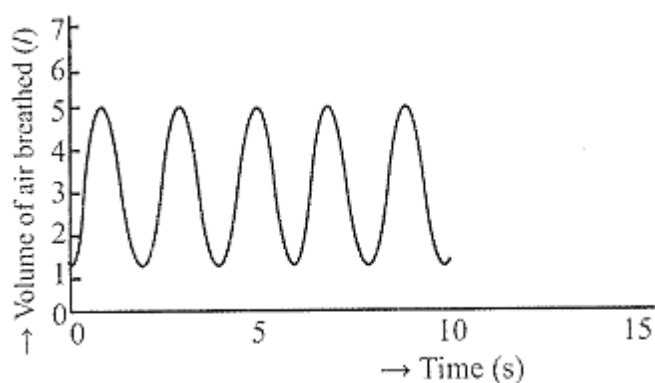


Figure 9

- i. Calculate the number of breaths the person takes per minute, show your working

(1 mark)

- ii. What is volume of air remains in the lung?

 (1 mark)

iii. How much air is exchange per breath

 (1 mark)

iv. Calculate the volume of air that is exhaled in one minutes show your working

(1 mark)

13. **Figure 10** is a graph showing the response of antibodies in the human body at different times. Use it to answer questions that follow.

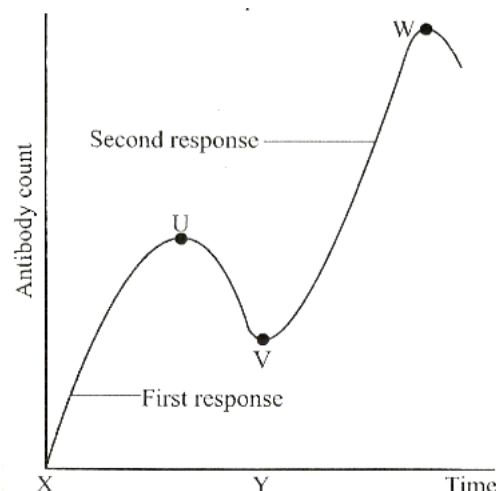


Figure 10

a. What type of immunity is shown in the diagram?

 (1 mark)

b. Give a reason for the decrease in the level of antibodies between U and V

_____(1 mark)

c. Why is there a rapid change in response between points V and W?

_____(1 mark)

d. Explain the role of each of the following in the body defense.

i. Killer T – cell

_____(1 mark)

ii. Memory cells

_____(1 mark)

e. Briefly explain how HIV weakens immunity.

_____(1 mark)

14.

a.

i. What is a reflex action?

_____(1 mark)

ii. State one way how reflex actions are important.

(1 mark)

- b. **Figure 11** below is a diagram showing the spinal cord and the reflex arc. Use it to answer questions that follow:

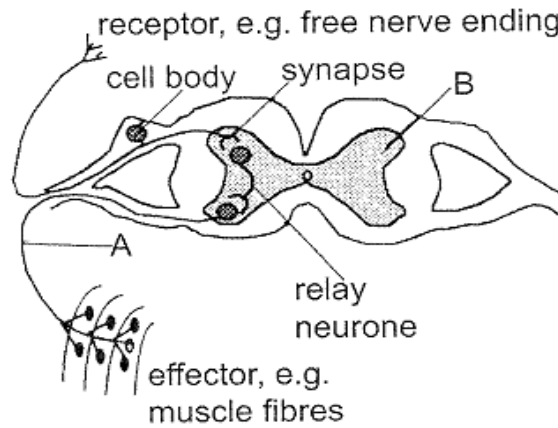


Figure 11

- i. Name the parts labelled A and B

A _____

B _____ (1 mark)

- c. Explain the effect of each of the following structures on movement of an impulse in neurone

- i. Myelin sheath

 _____ (1 mark)

- ii. Nodes of Ranvier

 _____ (1mark)

d. Explain how alcohol affects the speed of impulse in a neurone

(1 mark)

e. How are the impulse transmitted across the synapses?

(1 mark)

Section C (20.marks)

Essay questions

Answer all questions in this section

15. Describe an experiment that could be carried out to show that light is necessary for photosynthesis. Your answer should include procedure, expected results and conclusion in an essay form.

[illegible]

_____ (10 marks)

16. Suppose there is an outbreak of diarrhoea on a boarding school. Describe how you would establish the cause of the outbreak. Your answer should be in an essay form.

[illegible]

[illegible]

END OF QUESTION PAPER