

**NAME:** .....**ADM NO:** .....

**SCHOOL:** .....**STREAM:** .....

**INDEX NO:** .....

**231/1**

**BIOLOGY**

**Paper 1**

**AUGUST/SEPTEMBER 2021**

**2 HOURS**

**BUNYORE – MARANDA JOINT PRE-MOCK EXAMINATIONS**

**AUGUST/SEPTEMBER 2021**

**BIOLOGY**

**231/1**

**PAPER 1**

**FORM FOUR**

**2 HOURS**

**Instructions to candidates**

1. Write your name, school and index number in the spaces provided
2. Answer all questions in the spaces provided

**For Examiner's use only**

Question	Maximum Score	Candidate's Score
1 - 29	80	

1. Define the following branches of Biology. (2 marks)  
i) Genetics

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ii) Entomology

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2. State three reasons that necessitate classification of living organisms by taxonomists. (3 marks)

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3. Define resolving power of a microscope. (1 mark)

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4. State two functions played by the cell wall in plant cells and give the adaptation of the cell wall to performing each of the stated functions. (4 marks)

Function	Adaptation
i)	
ii)	

5. The cells of a certain herbaceous plant were found to have a diameter of  $25\mu\text{m}$ . The cells were placed in varying concentrations of sugar solution. The average diameter of the cells in each solution was determined and the results obtained were as shown in the table below.

Concentration of sugar solution (%)	Diameter of cells ( $\mu\text{m}$ )
1	50
5	40
10	30
15	20

- a) From the results determine the concentration of the cell sap. (1 mark)

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- b) Give an explanation for the average diameter of the cells placed in 15% sugar solution (3 marks)

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- c) Name the process that occurred in the cells which were placed in 1% sugar solution. (1 mark)

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6. (a) Name two defects of the circulatory system in humans. (2 marks)

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(b) State three functions of blood other than transport.

(3 marks)

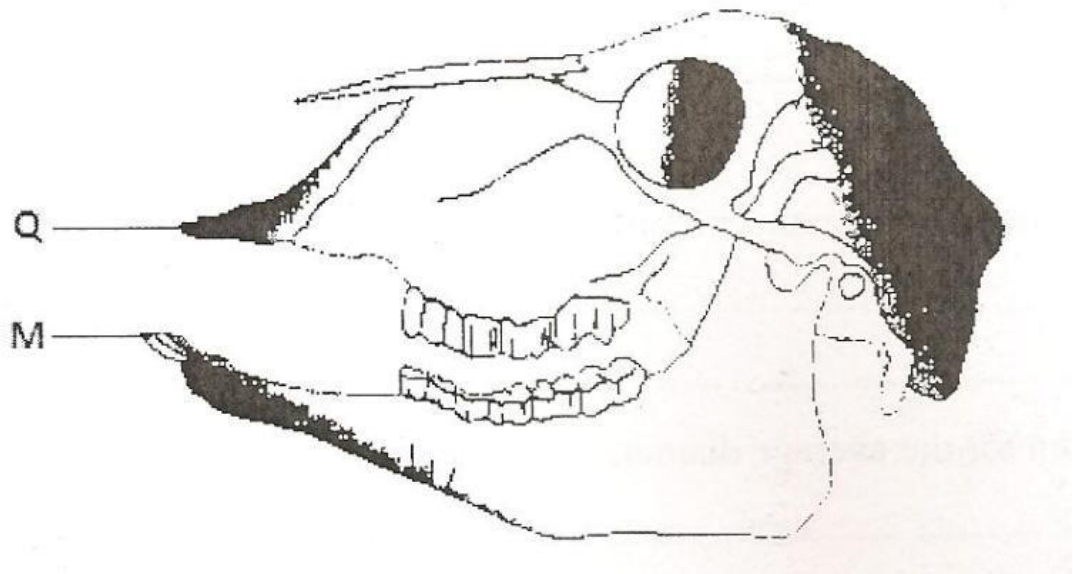
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7. The following specimens were extracted from a newly discovered organism.



a) Name the tooth labeled M.

(1 mark)

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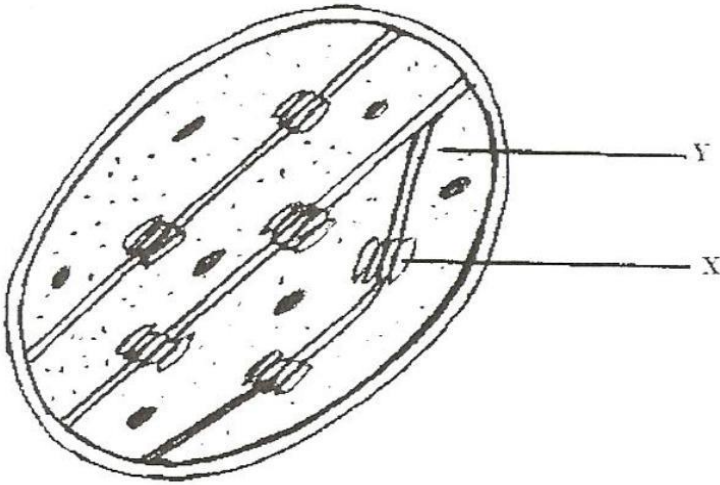
b) Name the part labeled Q and state its role.

(2 marks)

Name: .....

Role: .....

8. The diagram below represents a cell organelle



- a) Name the part labeled Y (1 mark)

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- b) State the function of the part labeled X (1 mark)

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9. (a) In what form is energy stored in muscles? (1 mark)

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- (b) State the economic importance of anaerobic respiration in plants. (2 marks)

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10. (a) Name two gaseous exchange surfaces in plants. (2 marks)

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(b) How are gaseous exchange surfaces in animals adapted to performing their function?  
(2 marks)

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11. What is the importance of counter flow system in fish? (2 marks)

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12. State two structural modifications of the kidneys of desert animals like the kangaroo rat.  
(2 marks)

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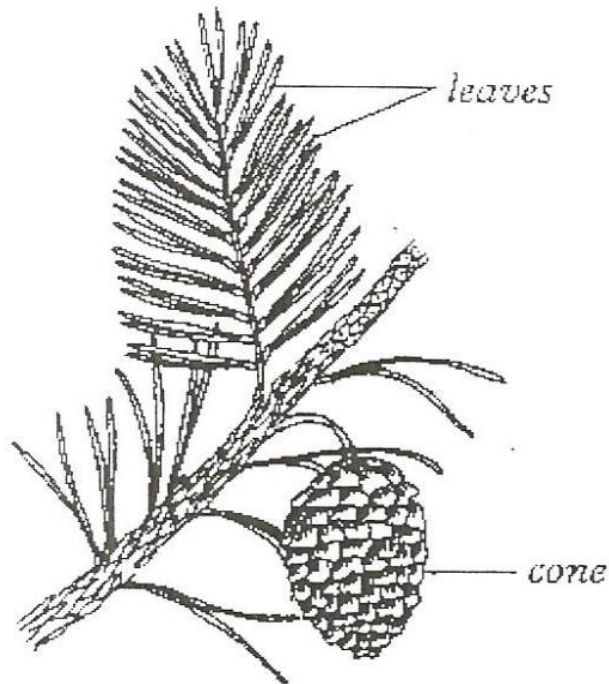
13. (a) Name the fluid that is produced by sebaceous glands. (1 mark)

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(b) What is the role of sweat on the human skin? (2 marks)

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14. The diagram below represents a certain plant species.



- a) State the class to which the plant belongs. (1 mark)
- .....
- .....
- b) State the difference between members of Gymnospermaphyta and Atngiospermaphyta (2 marks)
15. Give two reasons why a spider is classified under Phylum Arthropoda. (2 marks)

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16. (a) Define the following terms as used in ecology. (2 marks)  
i) Population

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- ii) Autecology

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- (b) From three students wanted to estimate the population of grasshoppers in  $5\text{km}^2$  grass field near a school compound. They captured 36 grasshoppers and marked them before returning them back to the field. After two days they made another catch of grasshoppers. They collected 45 grasshoppers of which only 4 had marks.

- i) State why the second capture was done after two days. (1 mark)

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- ii) From the data calculate the population size of grasshoppers in the grass field.

(2 marks)

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17. In mitosis in animals chromatids failed to separate and move to opposite poles

- a) Name the organelle that the cell was lacking (1 mark)

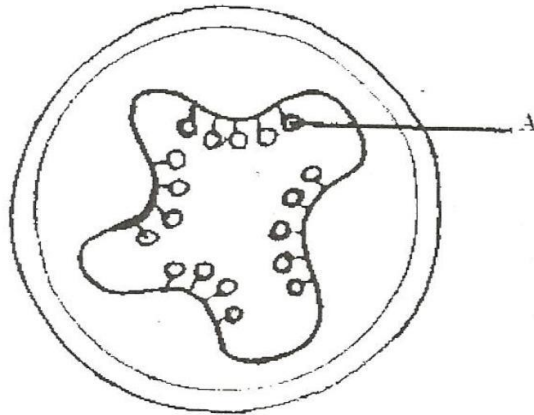
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- b) Name two regions in plants where cells actively undergo mitosis (2 marks)

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18. The diagram below represents a transverse section of an ovary from a certain flower.



- a) Name the structure labeled A. (1 mark)

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- b) Name the type of placentation illustrated in this diagram. (1 mark)

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19. (a) State the functions of the following parts (2 marks)

i) Endometrium

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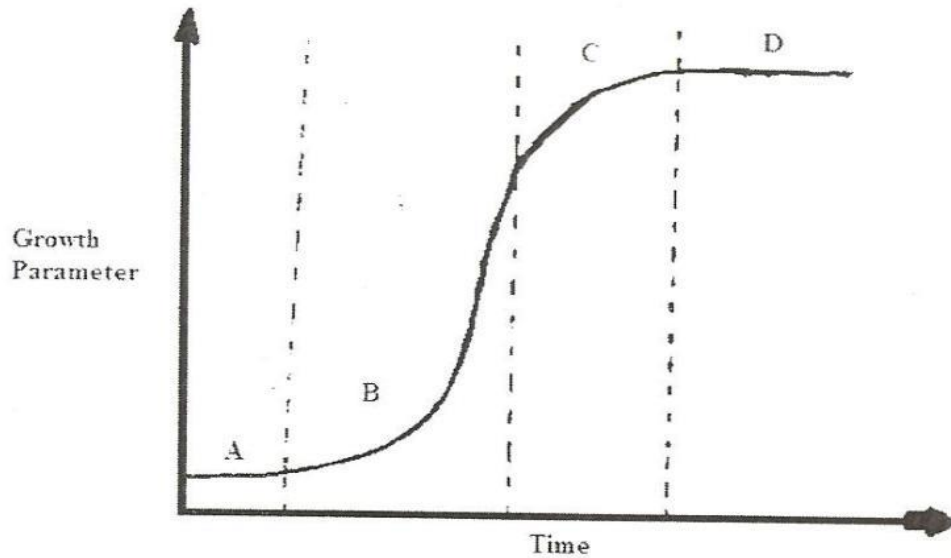
ii) Epididymis

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- b) What mechanism facilitates the movement of the ovum towards the uterus?

(1 mark)

20. Use the diagram below to answer questions that follow.



a) Identify the type of growth curve shown. (1 mark)

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b) State one factor that leads to phase labeled B (1 mark)

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.....

21. Give two differences between epigeal and hypogeal germination (2 marks)

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22. State the function of juvenile hormone in growth and development of insects. (1 mark)

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23. (a) What is sex linkage?

(1 mark)

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(b) Give two sex linked genes found on the Y chromosome.

(2 marks)

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24. Below is a nucleotide strand

A	A	G	T	C
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a) Identify the type of nucleic acid

(1 mark)

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b) Give a reason for your answer in (a) above

(1 mark)

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25. (a) What are analogous structures?

(1 mark)

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(b) Give one example of analogous structures.

(1 mark)

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(c) State comparative embryology as an evidence of organic evolution (2 marks)

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26. State two structural differences between apes and human beings. (2 marks)

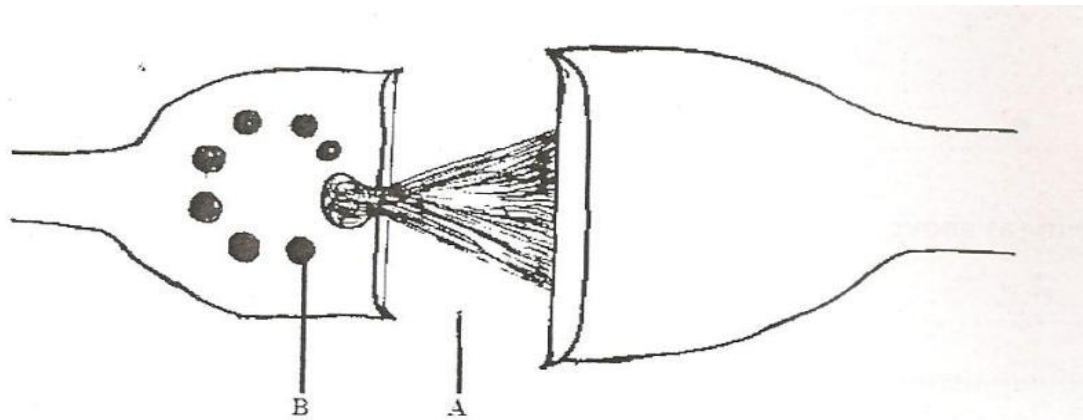
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27. The diagram below represents parts of a synapse.



a) Name part labeled A. (1 mark)

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b) What is the function of part labeled B. (1 mark)

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c) On the diagram show the direction of flow of impulse (1 mark)

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28. (a) State the function of cerebrospinal fluid (1 mark)

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(b) How is the choroid of the eye adapted to its function? (1 mark)

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29. (a) Name a support tissue in plants that is not thickened. (1 mark)

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(b) State the type of skeleton found in all vertebrates. (1 mark)

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**NAME:** .....**ADM NO:** .....

**SCHOOL:** .....**STREAM:** .....

**INDEX NO:** .....

**231/2**

**BIOLOGY**

**Paper 2**

**AUGUST/SEPTEMBER 2021**

**2 HOURS**

**BUNYORE – MARANDA JOINT PRE-MOCK EXAMINATIONS**

**AUGUST/SEPTEMBER 2021**

**BIOLOGY**

**231/2**

**PAPER 2**

**FORM FOUR**

**2 HOURS**

**INSTRUCTION TO CANDIDATES**

Answer ALL questions in section A. In section B answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

SECTION	QUESTION	MAX. SCORE	CANDIDATE'S SCORE
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
TOTAL		80	

SECTION A (40 Marks)

1. A climbing plant twines around the stem of a tall tree.

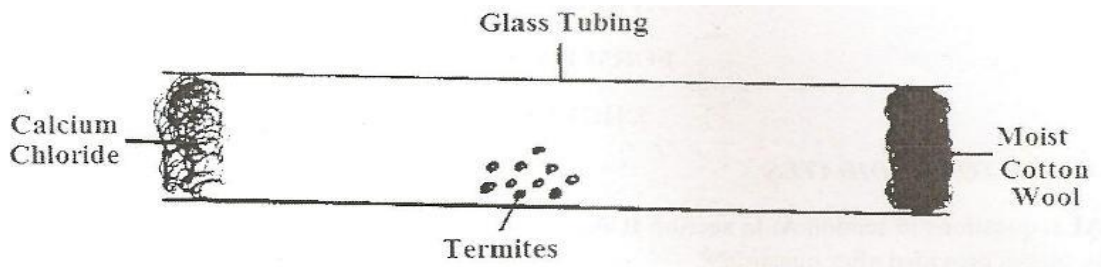
(a) (i) Name the type of response exhibited by the climbing stem. (1 mark)

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(ii) Explain how the response named in (a) (i) above takes place. (3 marks)

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(b) An experiment was carried out to investigate the response of white termites to a certain stimulus. Ten termites were placed at the centre of glass tubing. Calcium chloride was placed one end of the tubing and moist cotton wool at the other end as illustrated below.



(i) What observations are made after 20 minutes? (1 mark)

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.....

(ii) What type of response is exhibited by the termites? (1 mark)

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(iii) What is the survival value of the above response? (1 mark)

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(iv) What is Photonasty? (1 mark)

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2. (a) What is multiple allelism? (1 mark)

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(b) A pure breeding black male mouse was mated with a pure breeding brown female mouse. All the offspring had black coat colour.

- (i) Explain the appearance of black coat colour in the offspring. (1 mark)

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(ii) If the black parental mouse was mated with a mouse that is heterozygous for coat colour, work out the genotypic ratio of offspring. Show your working.

(4 marks)

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(iii) State two disorders in human beings that are as a result of chromosomal mutation.

(2 marks)

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3. (a) i) What is meant by the term biological control? (1 mark)

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- (ii) Give an example of biological (1 mark)

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(b) (i) What is eutrophication?

(3 marks)

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(ii) What are the effects of eutrophication?

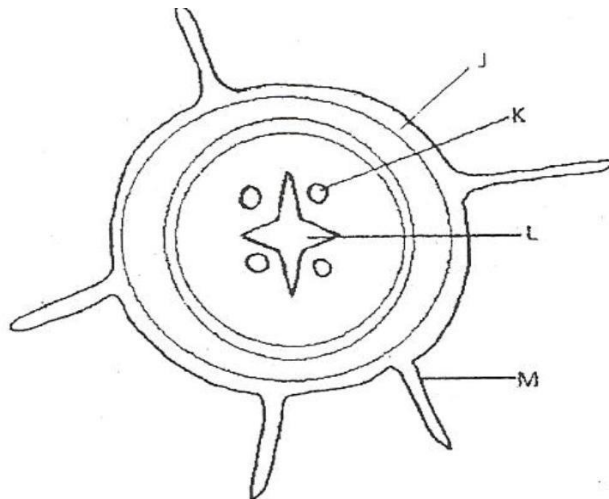
(3 marks)

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4. The diagram below represents a transverse section of a plant organ.



(a) From which plant organ was the section obtained.

(1 mark)

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(b) Give two reasons for your answer in (a) above.

(2 marks)

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(c) Name the parts labeled J, K and L

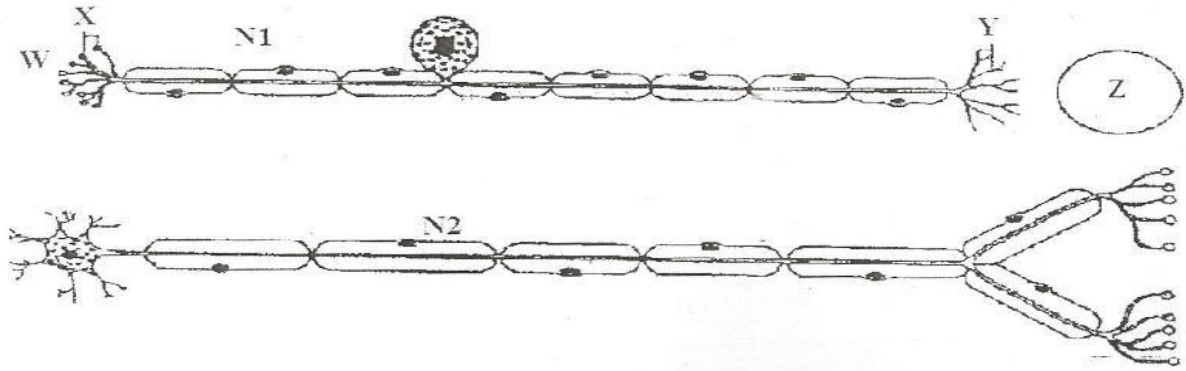
(3 marks)

J: .....

K: .....

L: .....

5. The diagrams below illustrate two types of neurons and associated structures. Study the diagrams carefully and answer the questions that follow.



- (a) (i) Identify the type of neurons illustrated in diagrams N1 and N2. (2 marks)

N1: .....

N2: .....

- (ii) Provide two reasons for your identity of the neuron in diagram N1. (2 marks)

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 .....  
 .....  
 .....

- (b) Name each of the structure labeled X and Y in diagram N1. (2 marks)

X: .....

Y: .....

- (c) Give the general name of the type of cell at position Z in diagram N1. (1 mark)

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 .....

- (d) Give the general name of the substance in position W in diagram N1 (1 mark)

.....  
 .....

**SECTION B (40 MARKS)**

Answer question 6 (compulsory) in the spaces provided. Answer either question 7 or 8 in the spaces provided after question 8.

6. An investigation was conducted to compare water rate of water loss from twigs of two different species of plants Q and L. the twigs had equal leaf surfaces. The results of the investigation were recorded in the below.

Time of the day	6 a.m	8 a.m	10 a.m	1 p.m	12 p.m	1 p.m	2 p.m	3 p.m	6 p.m	8 p.m	12 a.m
Water loss $\text{gh}^{-\text{h}}$	0	4	20	40	55	36	26	20	2	0	0
Water loss $\text{gh}^{-\text{h}}$ Species L	8	20	39	131	198	182	130	81	45	12	12

- (a) On the graph paper provided on page 7, plot a graph of Water loss  $\text{gh}^{-\text{h}}$  against time for the two plants. (7 marks)
- (b) Name the apparatus which might have been used to investigate the rate of water loss. (1 mark)

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- (c) State two precautions that were taken in setting up the experiment. (2 marks)

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Which of the plant species is likely to be adapted to arid conditions? Give a reason.

(2 marks)

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Use the graph to answer the following questions:

- (i) At what time of the day was  $60\text{gh}^{-1}$  of water lost by plant species L?

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(ii) What was the rate of water loss from plant species Q at 11.00 am? (1 mark)

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(f) Account for the rate of water loss between 6.00 a.m. to 1.00 p.m. by plant species L.

(4 marks)

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(g) Suggest how the stomata of species Q are structurally adapted to water loss.

(2 marks)

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7. Describe how the mammalian male reproductive system is adapted to perform its functions. (20 marks)

8. Describe the structure and functions of various organelles in a mature animal cell.

(20 marks)

Name: .....Index No.....

Candidate's Signature.....

Date: .....

231/3  
BIOLOGY  
Paper 3  
(PRACTICAL)

**MARANDA BUNYORE**  
**Premock-Examination**

BIOLOGY  
Paper 3  
(PRACTICAL)  
1 ¾ Hours

**Instructions to candidates**

- Write your name and index number in the spaces provided above.
- Sign and write the date of the examination in the spaces provided above
- Answer ALL the three questions in the spaces provided
- Spend the first 15 min of the 1hr 45 min to read through the paper carefully before commencing your work.
- Additional pages must NOT be inserted
- This paper consists of 5 printed pages
- Candidates should check the question paper to ensure that all the pages are printed as indicated and no question is missing.

FOR EXAMINER'S USE ONLY

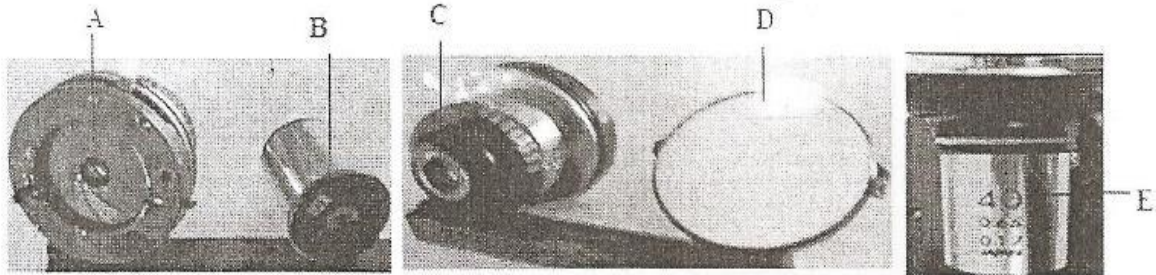
1. You are provided with a specimen labeled R which is a plant organ.  
(a) Carefully break it open along its length to expose inner parts hence draw a well labeled diagram of specimen R showing at least four parts. (3 marks)

(b) Crush the already broken specimen R into fine powder, put into a test tube and add 6ml of water to make solution R. Using the provided reagents carry out tests to identify the food substances present in solution R. (9 marks)

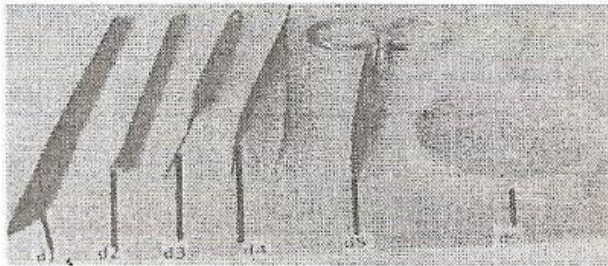
TEST FOR	PROCEDURE	OBSERVATION	CONCLUSION

2. The photograph P1 below illustrates some components of a light microscope while P2 show some instruments used for dissection in a biology laboratory. Study them carefully and answer the questions that follow.

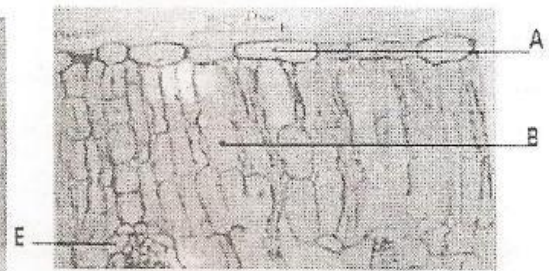
Photograph P1



Photograph P2



Photograph P3



- a) Identify the parts of the microscope labeled A, B, C, D and E and in each case state its function. (5 marks)

Part	Identity	Function
A		
B		
C		
D		
E		

- b) i) Name the instruments labeled d1, d2, and d3 (3 marks)

d1.....  
d2.....  
d3.....

- ii) State the role of d4, d5 and d6 during dissection (3 marks)

d4.....  
d5.....



d6.....

c) Photograph P3 shows the internal structures of a dicotyledonous leaf.

i) Name the parts labeled A and E. (2 marks)

A.....

E.....

ii) State two adaptations of cells B to their function. (2 marks)

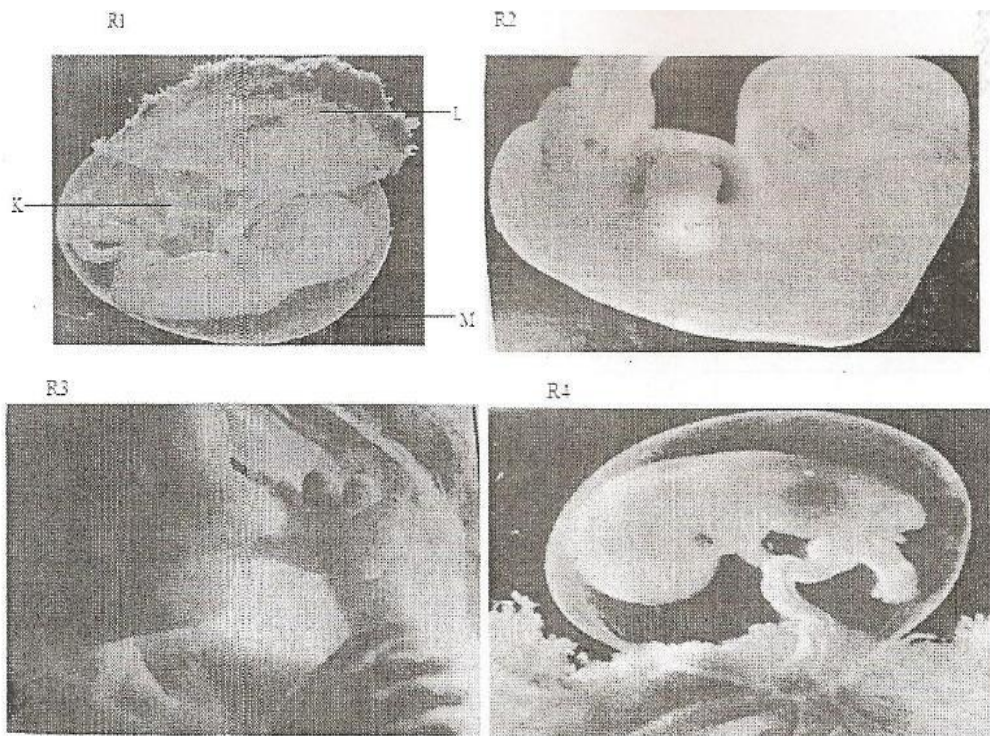
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iii) If the total magnification of the micrograph is X25'000, calculate the actual length of the vertical cross-section of the leaf. (3 marks)

3. Photographs R1, R2, R3 and R4 show fetuses at different stages of development after implantation in a human being. Use them to answer the questions that follow.





- a) Arrange the stages of development beginning with the latest. (1 mark)

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- b) Name the parts labeled K, L and M in photograph R1. (3 marks)

K .....

L .....

M .....

- c) Name:

- i) The blood vessels present in the part labeled K. (2 marks)

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.....

- ii) The tissue that form the part labeled L. (3 marks)

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- d) State one role played by the fluid enclosed by part M. (1 mark)

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