

Name: .....  
School: .....

Adm No: .....  
Date: .....

231 / 2  
BIOLOGY (THEORY)  
FORM 4  
MARCH/APRIL 2013  
TIME: 2HRS

**PENTAGON JOINT EXAMINATION - 2013**  
**(WARENG DISTRICT)**  
*(Kenya Certificate of Secondary Education)*  
**FORM FOUR BIOLOGY**

**INSTRUCTIONS TO CANDIDATES.**

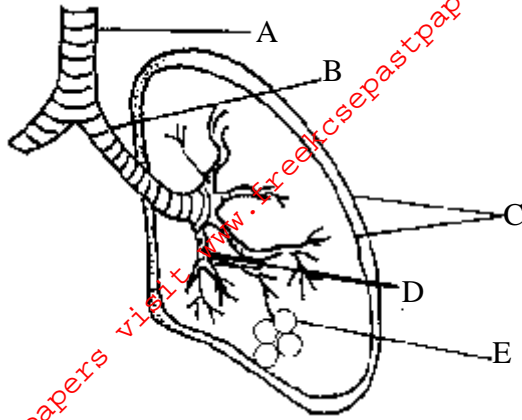
- Write your name and index number in the spaces provided
- Answer all the questions in section A in the spaces provided
- In section B answer question 6 (Compulsory) and either question 7 or 8 in the spaces provided.

**FOR EXAMINERS USE ONLY**

Section	Question	Maximum Score	Candidates Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	<b>Total Score</b>	80	

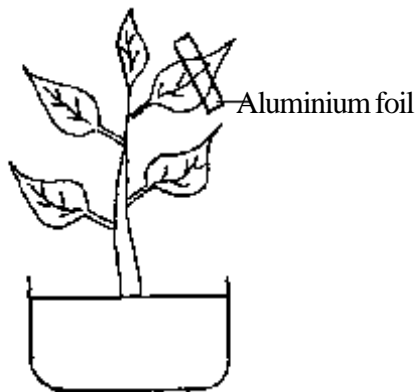
*This paper consist of 8 printed pages.  
Candidates should check the question paper to ascertain that all  
the pages are printed as indicated and that no question is missing.*

1. Study the diagram below and answer the questions that follow



- a) Name the parts labelled A,B,C and D. (2 marks)
- A \_\_\_\_\_
- B \_\_\_\_\_
- C \_\_\_\_\_
- D \_\_\_\_\_
- b) State the function of the fluid found in between the parts marked C. (1 mark)
- \_\_\_\_\_
- c) How is the part labelled E adapted to its function. (4 marks)
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- d) State the significance of rings of cartilage found around the part marked A and B. (1 mark)
- \_\_\_\_\_

2. In an experiment to investigate a factor affecting photosynthesis, a leaf of a potted plant which had been kept in the dark overnight was covered with aluminium foil as shown in the diagram below:-



The setup was kept in sunlight for three hours after which a food test was carried out on the leaf.

- a) Which food test was carried out? (1 mark)
- \_\_\_\_\_

b) i) State the results of the food test. (2 marks)

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iii) Account for the result of the food test. (2 marks)

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c) i) Why was the set up kept in sunlight for three hours? (1 mark)

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ii) Why was it necessary to keep the plant in the darkness before the experiment? (1 mark)

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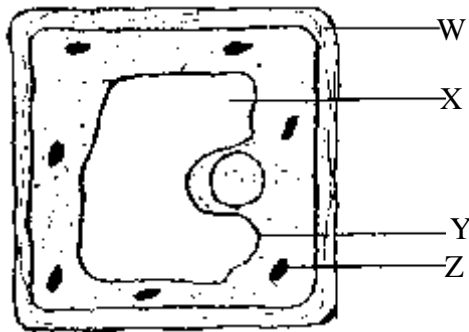
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d) Other than light, state one other factor that affect the rate of photosynthesis. (1 mark)

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3 Examine the diagram below carefully and use it to answer the questions that follow:-



a) Name the parts labelled X, Y and Z. (3 marks)

X \_\_\_\_\_

Y \_\_\_\_\_

Z \_\_\_\_\_

b) State one substance by which the part labelled W is made up of. (1 mark)

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c) Name the process by which mineral salts move into the structure labelled X (1 mark)

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d) Explain what happens to a red blood cell when placed in distilled water. (3 marks)

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4 a) Name any two disorders in human caused by gene mutation. (2marks)

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b) Describe the following chromosomal mutations. (2 marks)

a) Inversion

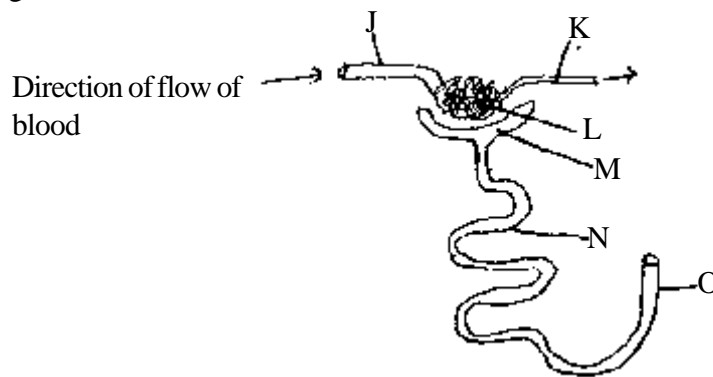
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b) Translocation.

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c) In mice the allele for black fur is dominant to the allele for brown fur. What percentage of offspring would have brown fur from across between heterozygous black mice? Show your working. Use letter B to represent the allele for black colour. (4 marks)

5 The diagram below shows a section of the functional unit of a mammalian kidney.



a) Identify the structure drawn. (1 mark)

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b) Name the parts labelled J and M (1 mark)

i) J

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ii) M (1 mark)

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c) What causes the process that occurs in structure L? (1 mark)

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d) Name **one** differences in the composition of fluids in structure K and O? (1 mark)

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e) State one adaptations of part N to its function. (1 mark)

f) State two adaptations that desert animals have to reduce water loss through urine. (2 marks)

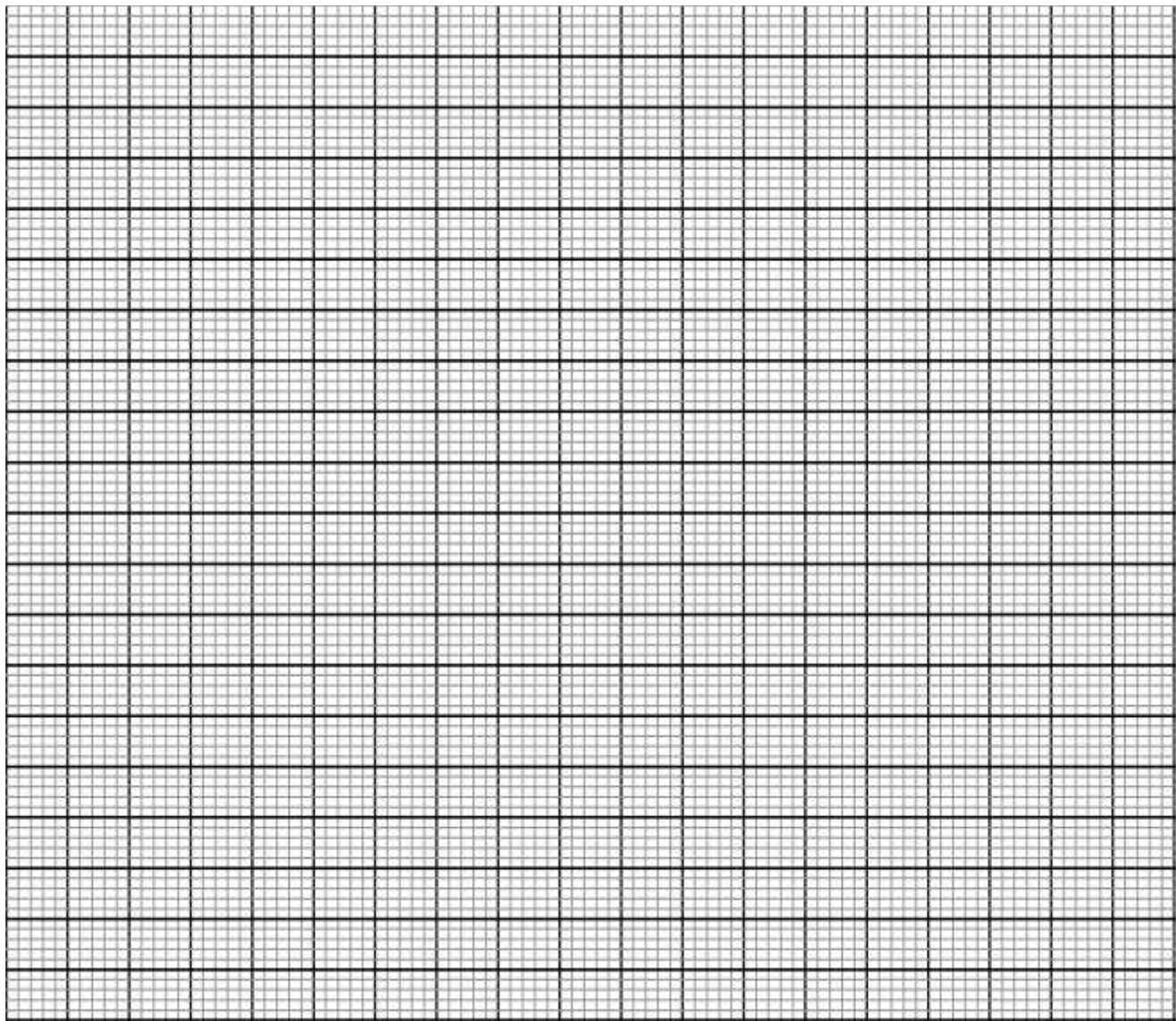
**SECTION B (40 MARKS)**

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

6. The data below was obtained from an experiment designed to measure the velocity of flow of water during the course of a single day in the xylem of two trees of the same species.

Time of day/hr		0300	0600	0900	1200	1500	1800	2100	2400	0300	0600
velocity of flow/cmhr <sup>-1</sup>	Eucalyptus	0	45	125	140	135	85	45	25	5	0
	Acacia species	-	5	105	135	110	45	30	25	10	0

a) Using the same axes, draw graphs to show the velocity of flow against time. (7 marks)



b) At what time of the day was the velocity of flow same for the species? (1 mark)

c) Account for the shape of the graph of eucalyptus. (4 marks)

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d) What forces move the water through the plant? (4 marks)

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e) Determine the rate of flow at 1900 hours in. (2 marks)

i) Acacia

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ii) Eucalyptus

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f) Suggest two features of Acacia that lead to the differences in the velocity flow. (2marks)

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7. Describe the role of the following hormones in the growth and development of plants. (20 marks)

- a) Auxins
- b) Gibberellins
- c) Cytokinins
- d) Ethylene



