Name ..... Index Number .....

School ..... Candidate's Signature .....

Date .....

231/2
BIOLOGY
Paper 2 (Theory)
2015
2 hours

MAKUENI COUNTY KCSE 2015 PREPARATORY EXAMINATION

Kenya Certificate of Secondary Education

BIOLOGY

(Theory)

Paper 2

2 hours

Instructions to candidates

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of examination in the spaces provided above.
*(c) This paper consists of **TWO** sections: **A** and **B**.*
*(d) Answer **ALL** the questions in section **A** in the spaces provided.*
*(e) In section **B** answer question **6 (compulsory)** and either question **7** or **8** in the space provided after question **8**.*
*(f) **This paper consists of 10 printed pages**.*
*(g) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing**.*

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	Total Score	80	

Sponsored by H.E. Prof. Kivutha Kibwana, Governor, Makueni County.

SECTION A (40 marks)

*Answer **All** the questions in this section in the spaces provided.*

1. In tomatoes, hairy stems are produced by a dominant genotype 'H' and hairless stem by its recessive allele 'h'.

(a) Using a punnet square, work out the outcome of a cross between two heterozygous hairy stemmed plants. (4 marks)

(b) State the phenotypic ratio of the products. (1 mark)

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(c) What will be the genotypes if the smooth variety is crossed with one of its parents? (1 mark)

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(d) State **two** ways in which genetics can be applied in the field of Agriculture. (2 marks)

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2. (a) State the **two** principle functions of the kidney. (2 marks)

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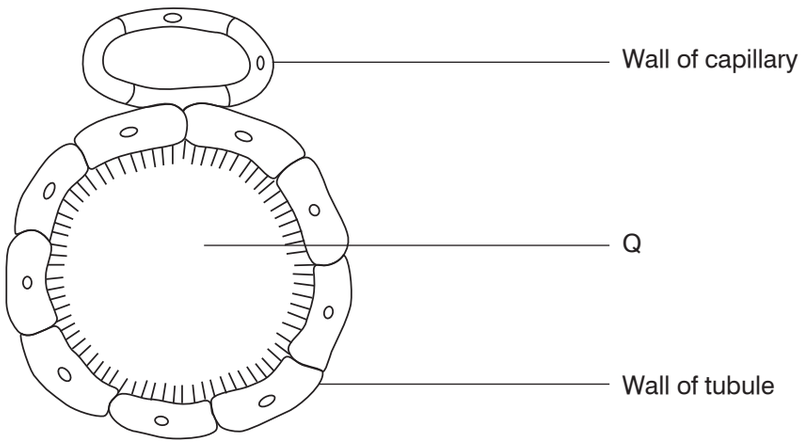
(b) The figure below shows a highly magnified cross-section of a proximal convoluted tubule of a mammalian kidney. Study it and answer the questions that follow.



(i) From the diagram, identify **three** structural features that adapt the proximal convoluted tubule to its function. (3 marks)

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(ii) Name the physiological process involved in the re-absorption of water and glucose from the proximal convoluted tubule to the bloodstream.

Water (1 mark)

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Glucose (1 mark)

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(iii) Which fluid substance flows in the part labelled **Q**? (1 mark)

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3. (a) What is active transport? (1 mark)

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(b) State **three** factors that increase the rate of active transport. (3 marks)

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(c) Give four roles of active transport in living organisms. (4 marks)

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4. (a) State the difference between Lamarckian and Darwinian theories of evolution. (2 marks)

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(b) State **three** pieces of evidence that support the theory of evolution. (3 marks)

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(c) Explain continental drift as evidence of evolution. (3 marks)

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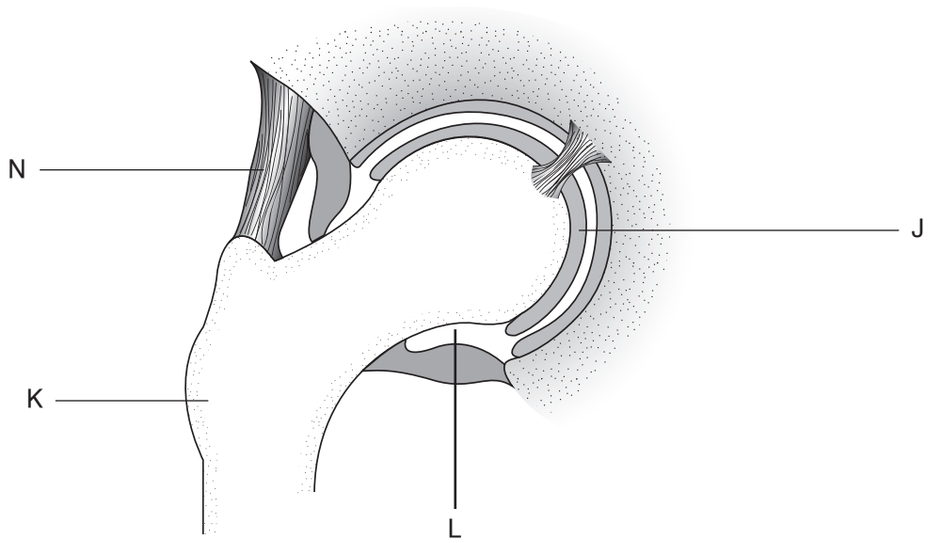
5. The diagram below shows some of the features of a synovial joint. Study the diagram carefully and answer the questions that follow.



(a) Name the type of synovial joint. (1 mark)

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(b) Name the parts labelled **J**, **K** and **L**. (3 marks)

J .....

K .....

L .....

(c) State **two** roles of the part labelled **L**. (2 marks)

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(d) Suggest **one** advantage of this type of joint. (1 mark)

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(e) Give the name of the bone adjacent to the proximal end of **K**. (1 mark)

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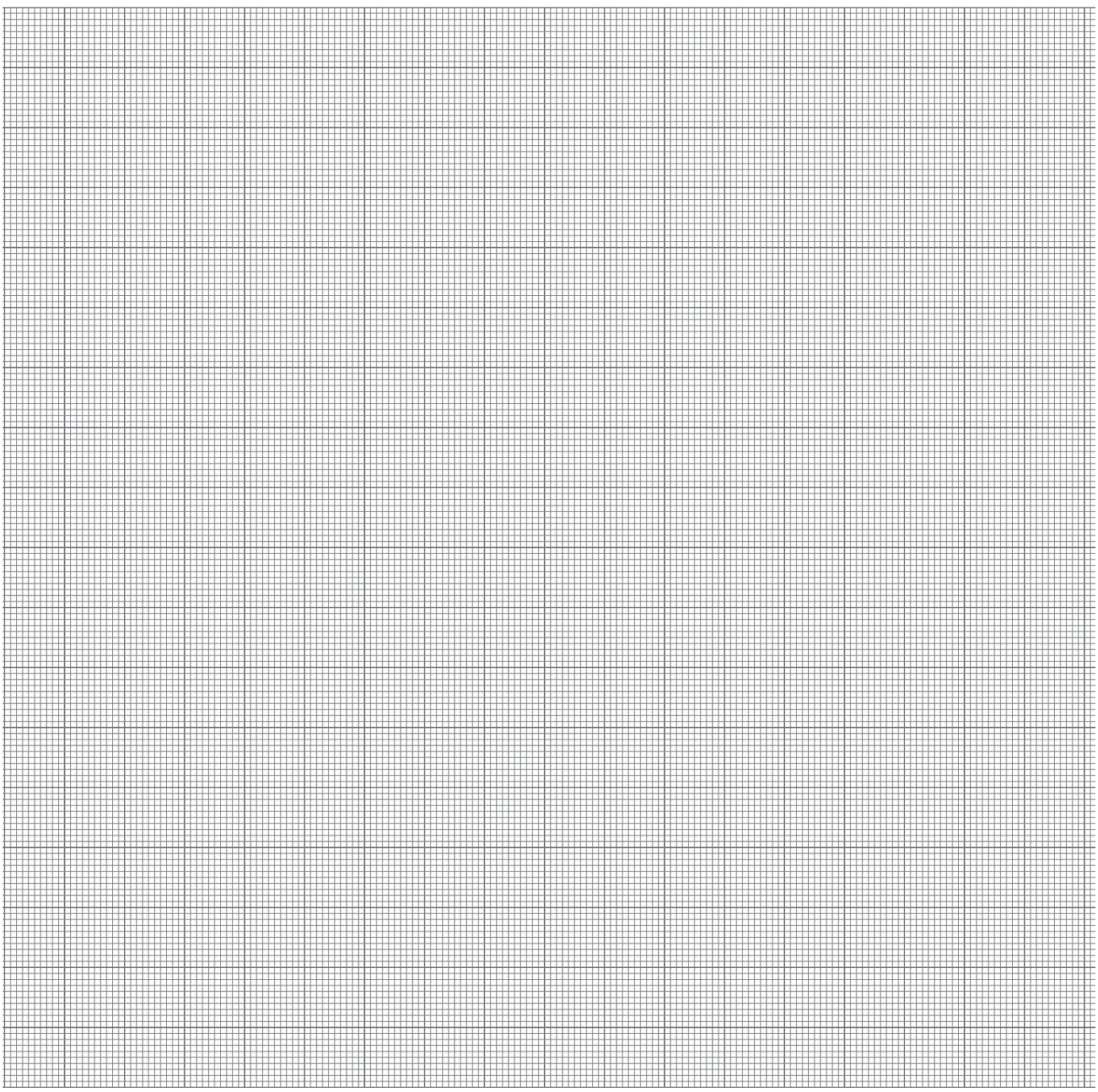
SECTION B (40 marks)

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

6. The data below shows growth of the pollen tube in a tradescantia style.

Time in minutes	**Growth in millimetres**
0	0
30	4
60	10
100	17
120	20
160	22
180	23

(a) Plot a graph of the pollen tube growth against time. (6 marks)



(b) What was the length of the pollen tube at 90 minutes? (1 mark)

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(c) Describe the growth of the pollen tube between 0 and 120 minutes. (3 marks)

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(d) (i) State the importance of a pollen tube to the plant. (1 mark)

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(ii) Identify the shape of curve shown by the graph. (1 mark)

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(e) (i) Arthropods show a different growth pattern from the one shown above. What is the name of the growth pattern exhibited by arthropods? (1 mark)

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(ii) Explain your answer in (e) (i) above. (4 marks)

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(f) (i) Distinguish between primary and secondary growth. (2 marks)

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(ii) Give a reason why members of class monocotyledonae do not undergo secondary growth. (1 mark)

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7. Blood has two main functions namely protective and transport.

(a) Explain how blood is involved in transport, stating the constituents of blood involved. (14 marks)

(b) Identify **two** sites in the mammalian body where red blood cells are manufactured. (2 marks)

(c) Describe how blood protects the body. (4 marks)

8. How is the leaf of a mesophyte plant adapted to its function? (20 marks)

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