Name ……..…… Index Number …….

Adm ……. Class …….

231/2 **Candidate's Signature ……...**

BIOLOGY **Date …….**

Paper 2
(THEORY)
July / August 2011
2 hours

BARINGO COUNTY EDUCATION IMPROVEMENT TEST
Kenya Certificate of Secondary Education
BIOLOGY
Paper 2
(THEORY)
2 hours

Instructions to candidates

(a) Write your details in the spaces provided above.
*(b) This paper consist of **TWO** sections; **A** and **B**.*
*(c) Answer **All** the questions in the section **A** in the spaces provided.*
*(d) In section **B** answer Question **6 (compulsory)** and either question **7** or **8** in the space provided after question **8***

For examiner's 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	
Total		80	

This paper consists of 10 printed pages.
Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (40 marks**)**

*Answer **ALL** the questions in this section in the spaces provided*

1. (a) What is meant by the term sex-linkage? (1 mark)

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(b) State the first law of inheritance. (2 marks)

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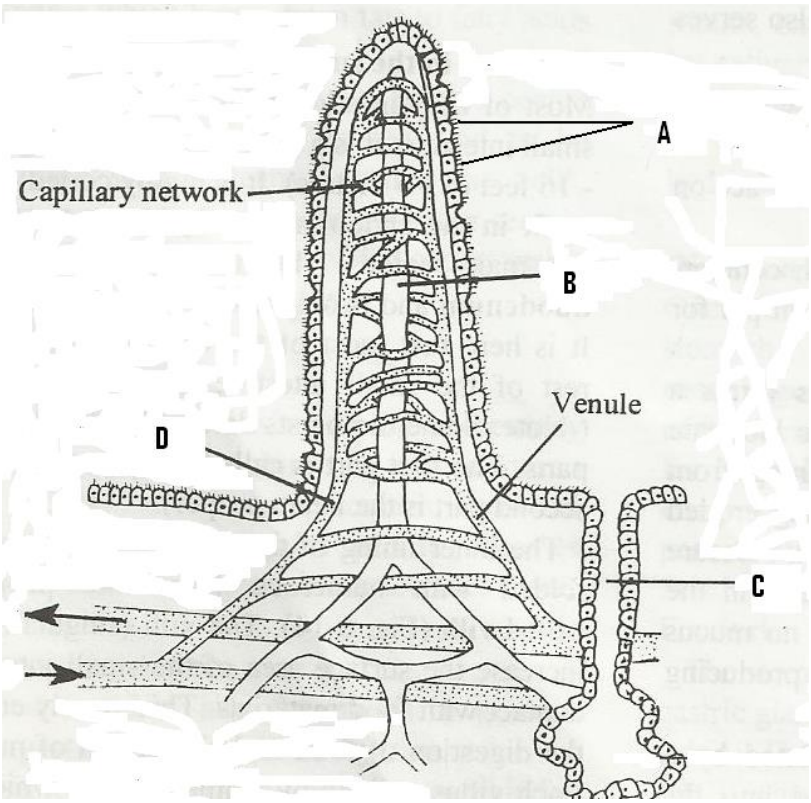
(c) In *Drosophila melanogaster*, the inheritance of eye colour is sex-linked. The gene for red eye is dominant. A cross was made between a heterozygous red eyed female and a white eyed male. Work out the genotypic ratio of the F_1 generation. Use R to represent the gene for red eyes. (5 marks)

2. The figure below represents a structure obtained from the ileum of a mammal.



(a) Give the identity of the structure. (1 mark)

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(b) What is the importance of the structure named in (a) above? (1 mark)

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(c) Name the parts labeled A, B and D. (3 marks)

A ……

B ……

D ……

(d) (i) Name the juice secreted by the part labeled C. (1 mark)

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(ii) List two enzymes present in the juice named in d (i) above. (2 marks)

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3. The data below was collected by ecology students during their practical session in a slow moving river starting from the source, after raw sewage was reported to have been discharged into the river. Use the data to answer the questions that follow.

Distance town stream (KM)	**Concentration of various substances (Pmm)**		
	Organic matter	Nutrient ions	Dissolved oxygen
0	5	5	10
1	80	10	5
2	70	25	2
3	60	50	6
4	30	40	8
5	5	5	10

(a) Account for the sudden drop in the concentration of dissolved oxygen; (2 marks)

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(b) Account for the concentration of nutrient ions between 1 Km and 3 Km.

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…… (2 marks)

(c) Why does the concentration of organic matter reduce down stream? (1 mark)

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(d) Apart from sewage, list **three** sources of water pollution. (3 marks)

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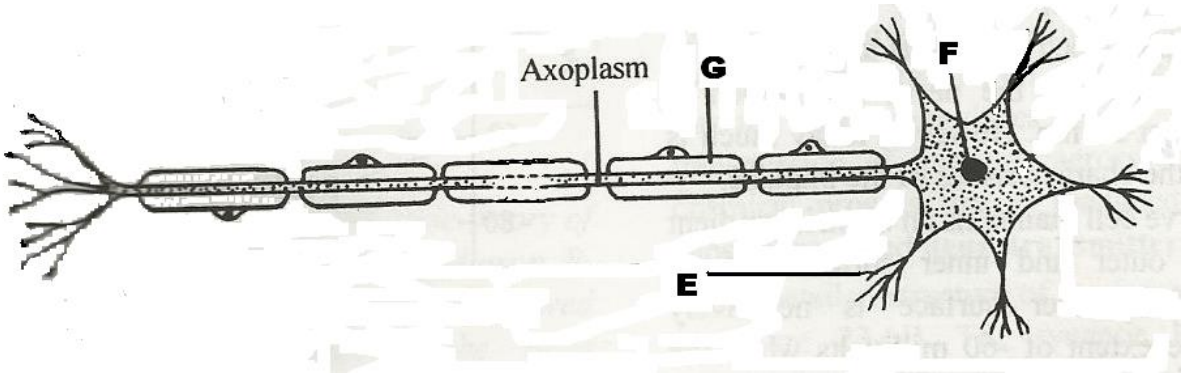
4.



(a) With a reason, identify the type of nerve cell shown above. (2 marks)

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(b) Name the parts labeled E and F. (2 marks)

E ……

F ……

(c) (i) What role does the cell shown play in the human body. (1 mark)

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(ii) How is the cell adapted to its function? (1 mark)

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(e) State **two** differences between nervous communication and endocrine communication (2 marks)

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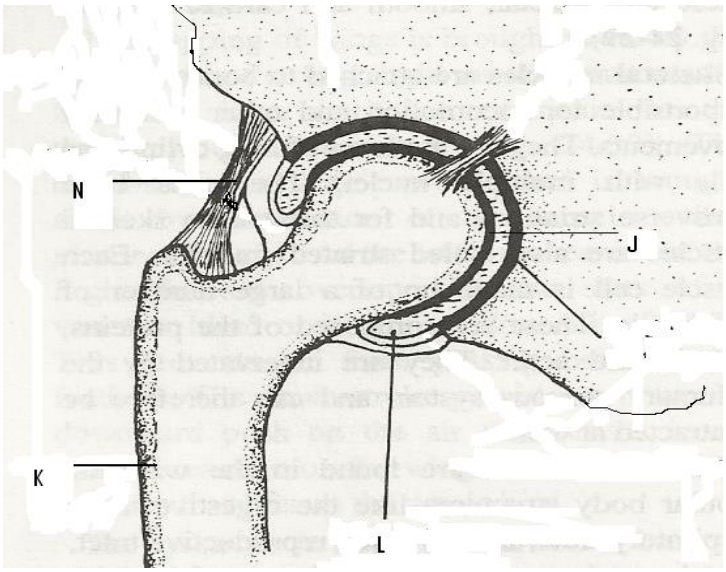
5. The diagram below shows some of the features of a synovial joint. Study the diagram carefully and answer the questions that follow.



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

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(b) Name the parts labeled J, K and L (3 marks)

J ……...

K ……..

L ……..

(c) State **two** roles of the part labeled 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 spaces provided after question **8***

6. The table shows results of an experiment where constant volumes of blood of a certain mammal were used to determine the percentage saturation of haemoglobin with oxygen. The experiment was performed under different conditions of oxygen partial pressure, pH and excess carbon IV oxide. When equilibrium was attained under each condition, the percentage saturation of haemoglobin with oxygen was determined.

Oxygen partial Pressure (mmHg)	**% saturation of haemoglobin with oxygen**		
	pH 7.0	**pH 7.8**	**Excess carbon IV oxide**
0	0.0	0.0	0.0
25	32.0	60.0	25.0
50	65.0	80.0	52.0
75	77.0	88.0	63.0
100	82.0	92.0	68.0
125	88.0	96.0	70.0
150	93.0	99.0	71.0
200	95.0	99.0	73.0

(a) Using the same axes and suitable scale, draw graphs of percentage saturation of haemoglobin at different pH and in excess carbon IV oxide against oxygen partial pressure.

(8 marks)

(b) Explain why the effects of excess carbon IV oxide are similar to the effects of low pH.

(2 marks)

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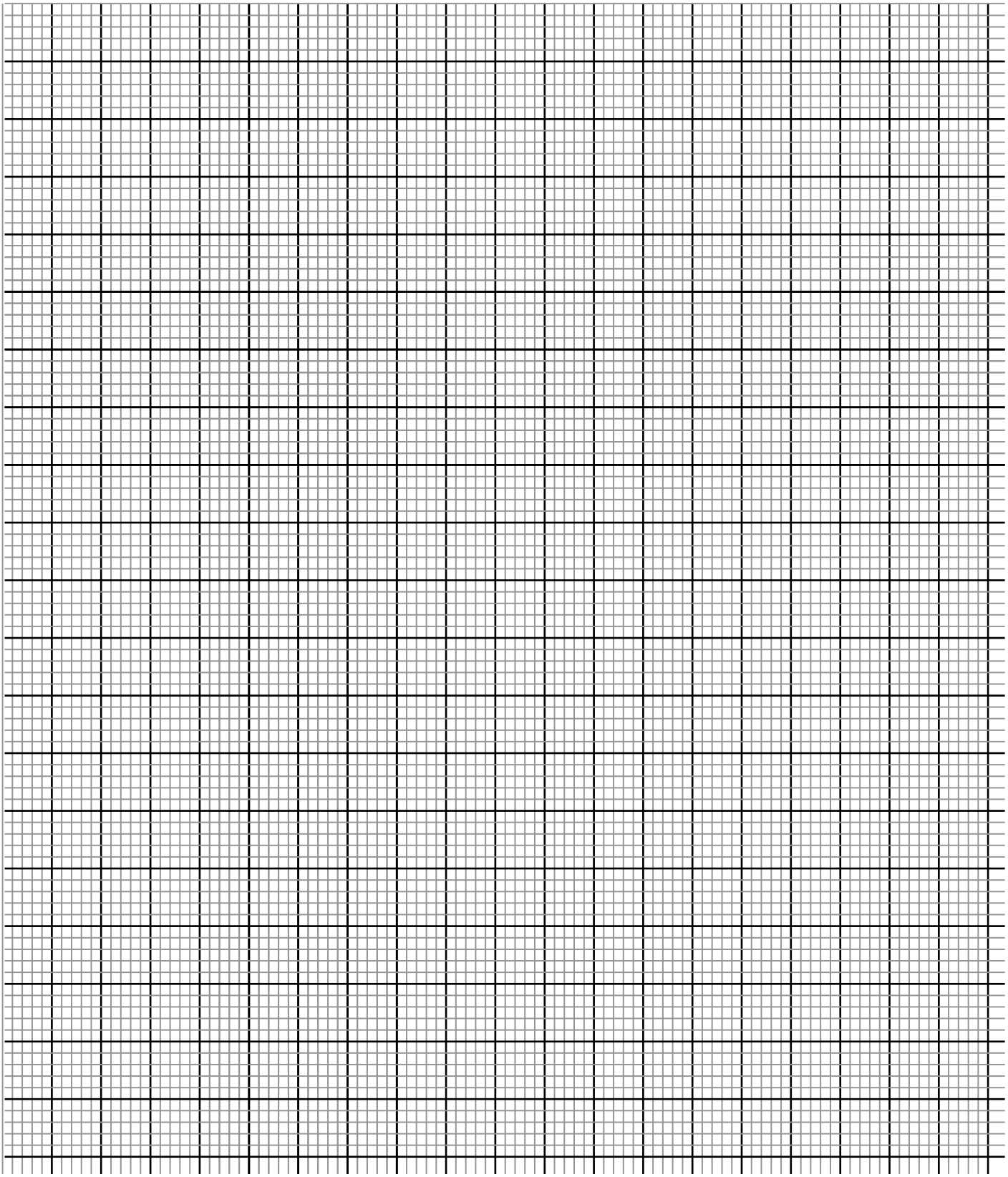

(c) From the graph, explain how the presence of high concentration of carbon IV oxide in the blood may be of benefit to the tissues deficient in oxygen. (2 marks)

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(d) From the graph, what will be the percentage of haemoglobin saturation with oxygen at pH 7.8, when the partial pressure of oxygen is 80 mmHg. (1 mark)

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(e) Explain the conditions that favour gaseous exchange in the;

(i) lungs (3 marks)

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(ii) internal tissues of insects. (2 marks)

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(f) Athletes who normally live at low altitude should train in high altitude before major competitions. Explain the respiratory changes acquired during the training. (2 marks)

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7. Explain how seeds and fruits are adapted to various methods of dispersal. (20 marks)

8. Describe the structural adaptations of the mammalian heart to its functions. (20 marks)