**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Index No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class \_\_\_\_\_**

**Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**231/2**

**BIOLOGY**

**Theory**

**PAPER 2**

**JULY - 2015**

**2 HOURS**

**STAREHE GIRLS’ CENTRE**

**MOCK EXAMINATION - JULY 2015**

**Instructions to Candidates:**

1. Write your name, index number, date and signature in the spaces provided
2. This paper contains two sections A and B.
3. Answer all questions in section A in the spaces provided.
4. In Section B answer question **6** (Compulsory) and either question **7** or **8** in the spaces provided at the end of each question.

**FOR EXAMINERS USE ONLY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Questions** | **Max. Score** | **Candidate’s score** |
|  | **1** | **8** |  |
| **A** | **2** | **8** |  |
| **3** | **8** |  |
| **4** | **8** |  |
| **5** | **8** |  |
| **B** | **6** | **20** |  |
| **7 or 8** | **20** |  |
|  | **Total** | **80** |  |

**This paper consists of 11 printed pages. Students should check the question paper to ensure that all pages are**

**Printed as indicated and that no questions are missing**

**SECTION A - (40 MARKS)**

**Answer all questions in the spaces provided after each question in the spaces provided after each question.**

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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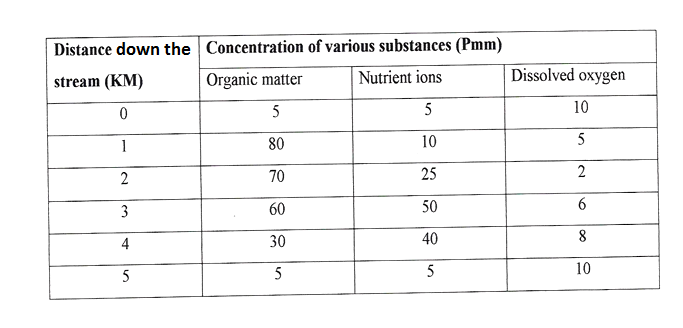
c) In drosophila melanogaster, the inheritance of eye colour is sex-linked. The gene for red eye is

dominant . A cross was made between a heterozygous red eyed female and a white eyed male.

Work out the genotypic ratio of the F1 generation. Use R to represent the gene for red eyes.

(5 marks)

2. 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.



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. (2 marks)

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c) Whys does the concentration of organic matter reduce down stream? (1 marks)

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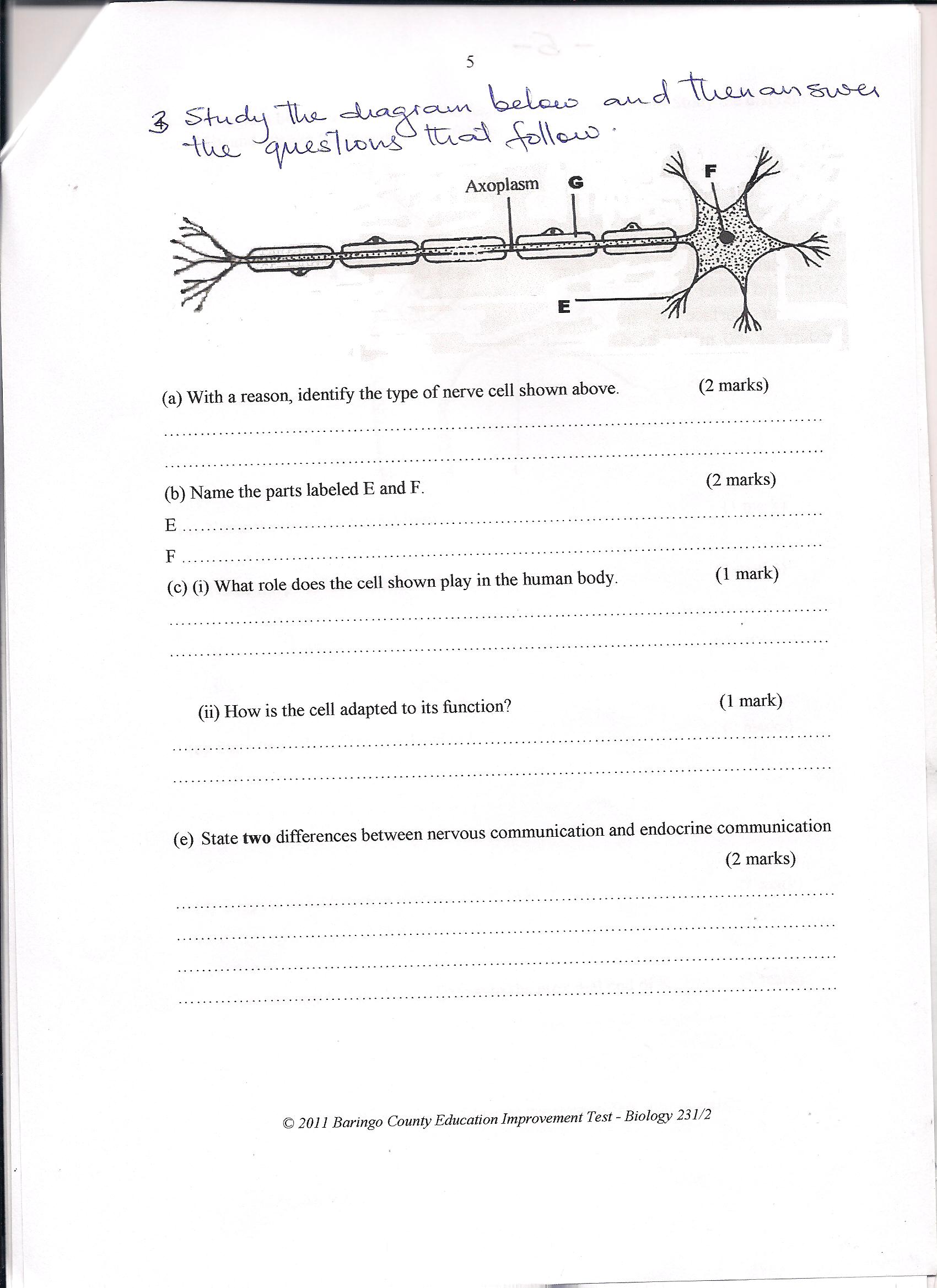
d) Apart from sewage, list three other sources of water pollution. ( 3 marks)

1) …………………………………………………………………………………………………

2) …………………………………………………………………………………………………

3) …………………………………………………………………………………………………

3. Study the diagram below and then answer the questions that follow.



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)

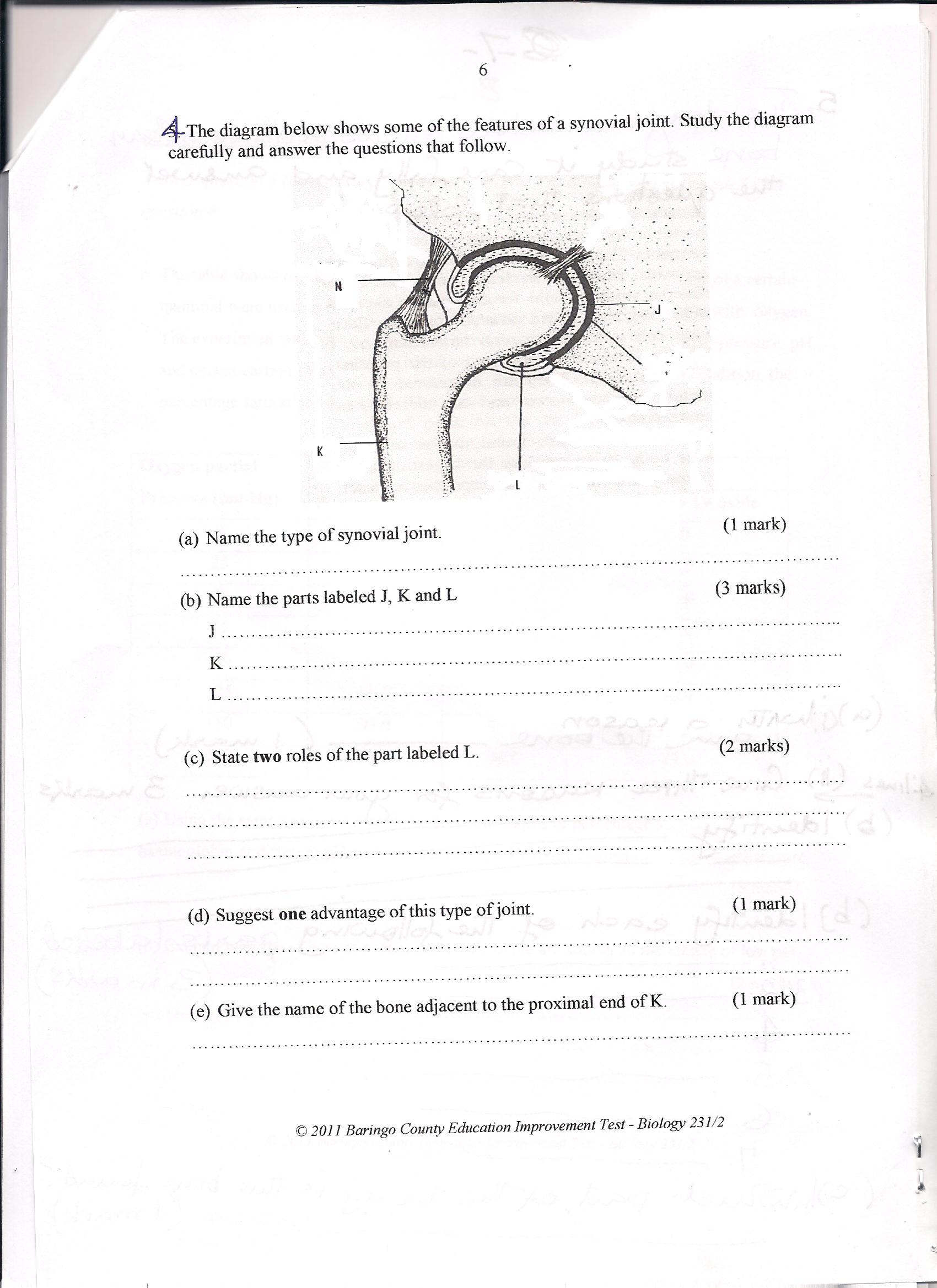
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e) State two differences between nervous communication and endocrine communication.

(2 marks)

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4. 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 shown above. (1 mark)

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b) Name the parts labeled J, K and L. (2 marks)

J…………………………………………………………………………………………………

K…………………………………………………………………………………………………

L…………………………………………………………………………………………………

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

i) ………………………………………………………………………………………………………

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ii) ………………………………………………………………………………………………………

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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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5. a) Draw a large and well-labelled diagram of a mature embryo sac. (4 marks)

b) Explain what double fertilisation. (2 marks)

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c) Outline two mechanisms that hinder self pollination. (2 marks)

i) ………………………………………………………………………………………………………

……………………………………………………………………………………………….....………

ii) ………………………………………………………………………………………………………

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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***

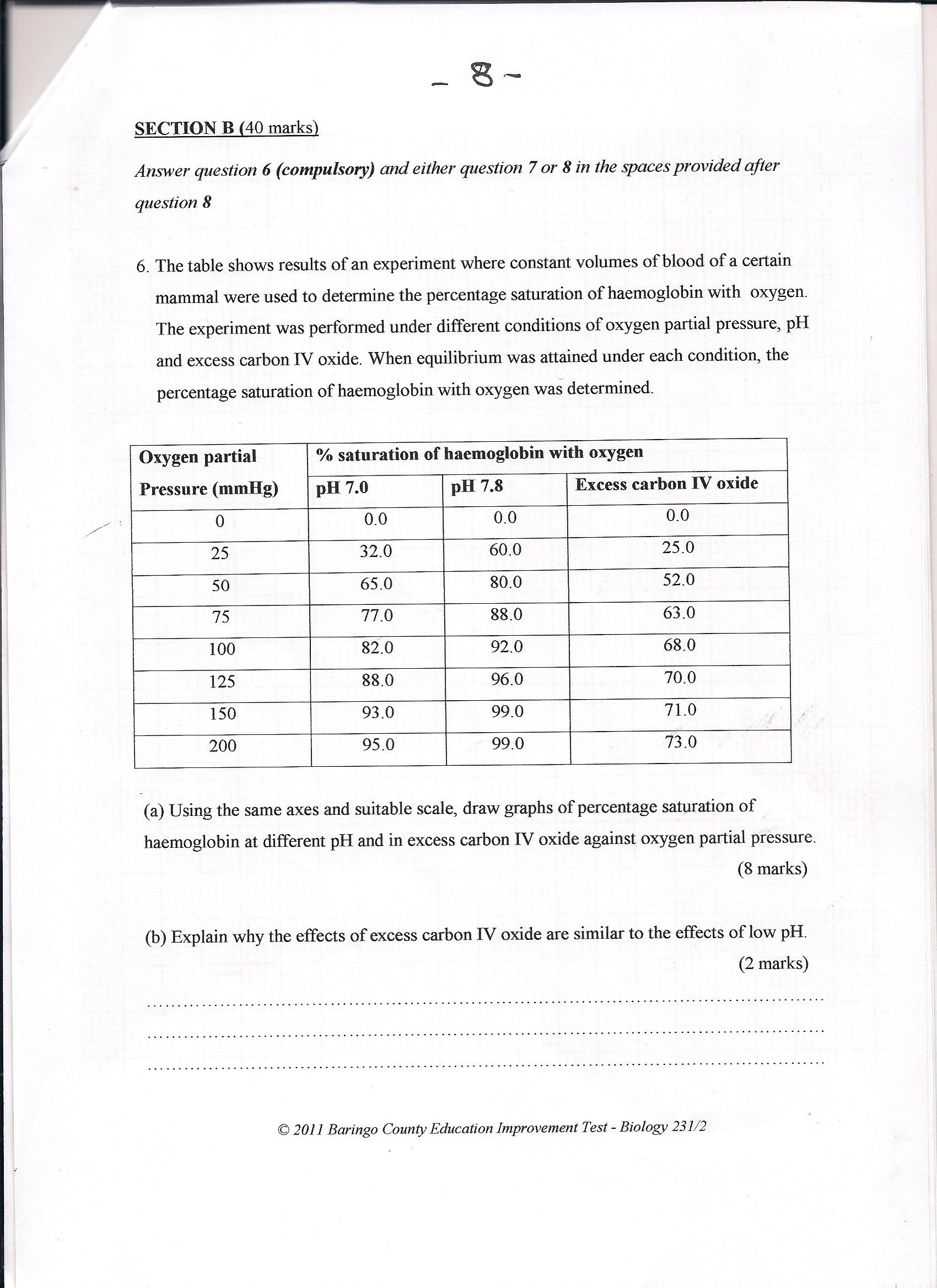
6. The table shows results of an experiment where constant volumes of blood of a certain

mammal were used to determine the percentage saturation of haemoglobin with oxygen. The

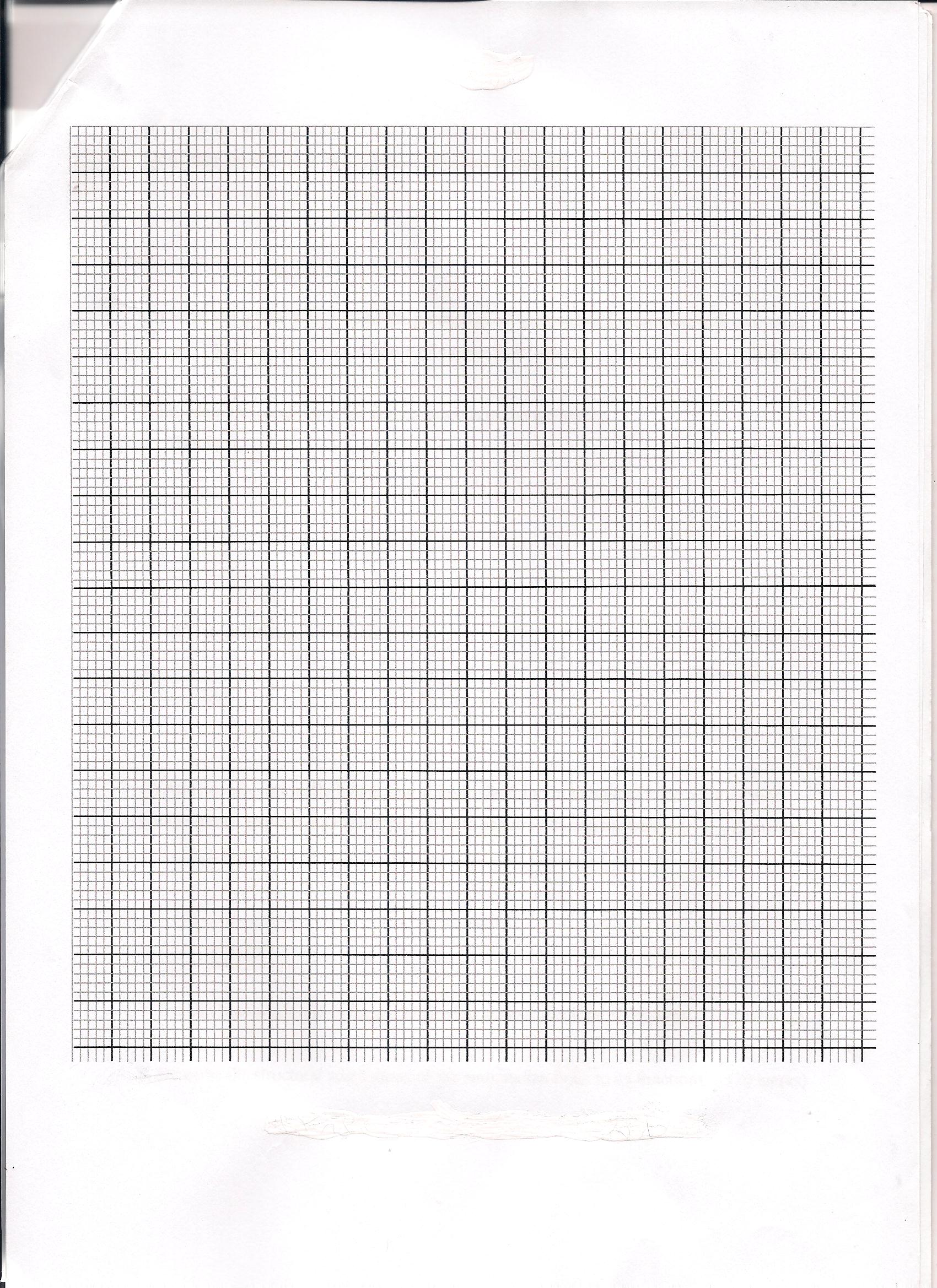
experiment was performed under different conditions of oxygen partial pressure, pH and

exceess carbon IV oxide. Whe equilibrium was attained under each condition, the percentage

saturation of haemoglobin with oxygen was determined.



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; (3 marks)

i) Lungs

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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 completions. 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. (2 0 marks)

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

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