**BIOLOGY PAPER 2(231/2)**

**NAME……………………………………………. INDEX NO. ………………………….**

**231/2 Candidate Signature…………………..**

**BIOLOGY Date…………………………**

**Oct/Nov. 2021**

**2 hours**

**NAMBALE DIOCESE**

* Kenya Certificate of secondary Education (KCSE)
* Write your name and index number in the spaces provided above.
* Sign and write the date of examination in the spaces provided above.
* This paper consists of TWO sections A and B.
* Answer ALL the questions in sections in section A in the spaces provided.
* In section B answer question 6(Compulsory) and either question 7 or 8 in the spaces provided after question 8.

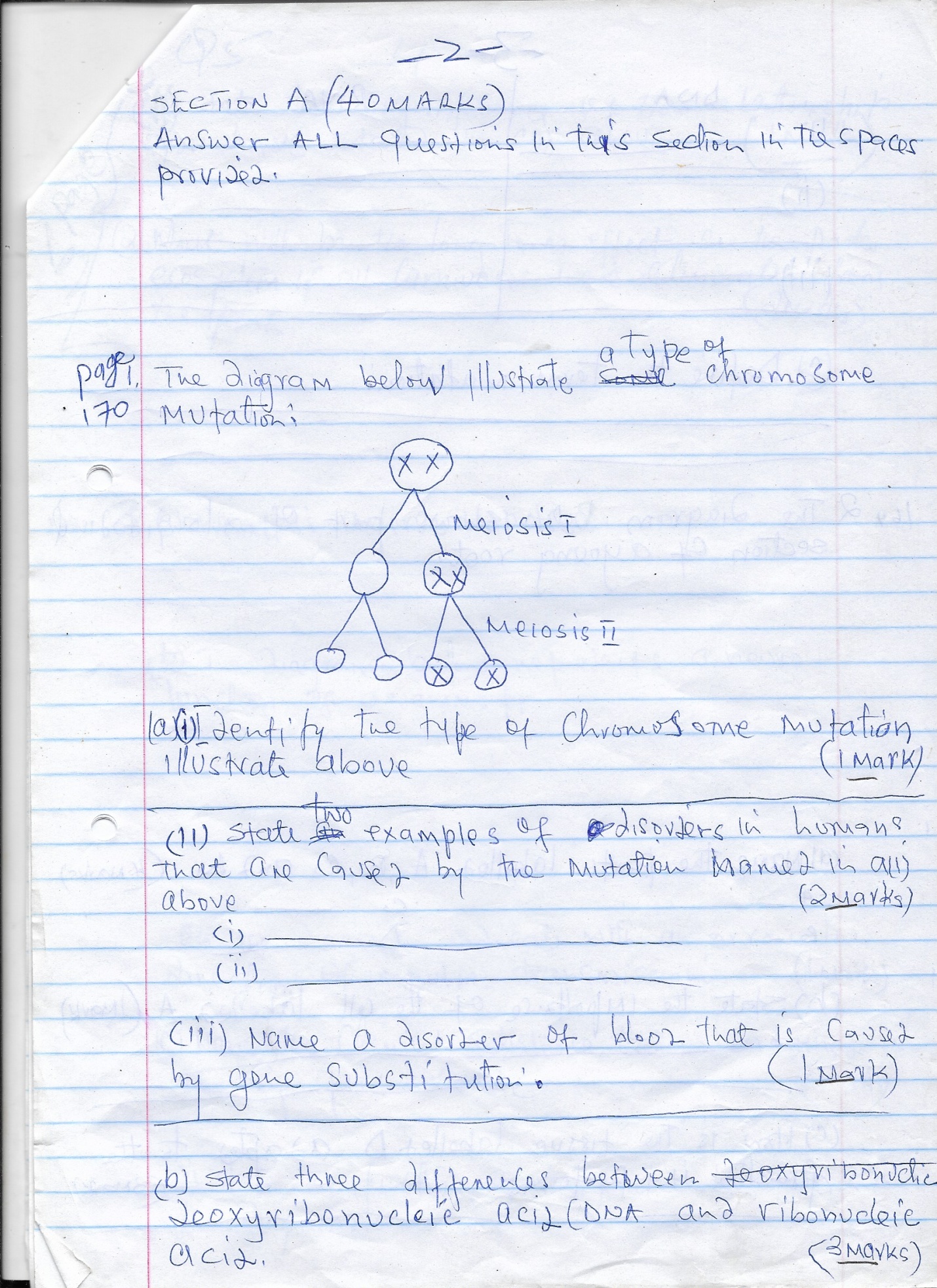
For examiner’s use only

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| --- | --- | --- | --- |
| **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 |  |

**SECTION A (40MKS)**

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

1. The diagram below illustrate a type of chromosome mutation.



(a) (i) Identify the type of chromosome mutation illustrate above. (1mk)

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(ii) State two examples of disorders in humans that are caused by the mutation named in a(i)

above. (2mks)

(i) ………………………………………………………………………………………………………………..

(ii) ………………………………………………………………………………………………………………..

(iii) Name a disorder of blood that is caused by gene substitution. (1mk)

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(b) State three differences between deoxyribonucleic acid (DNA and ribonucleic acid. (3mks)

DNA RNA

i) …………………………………………….. …………………………………………

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ii)…………………………………………….. …………………………………………

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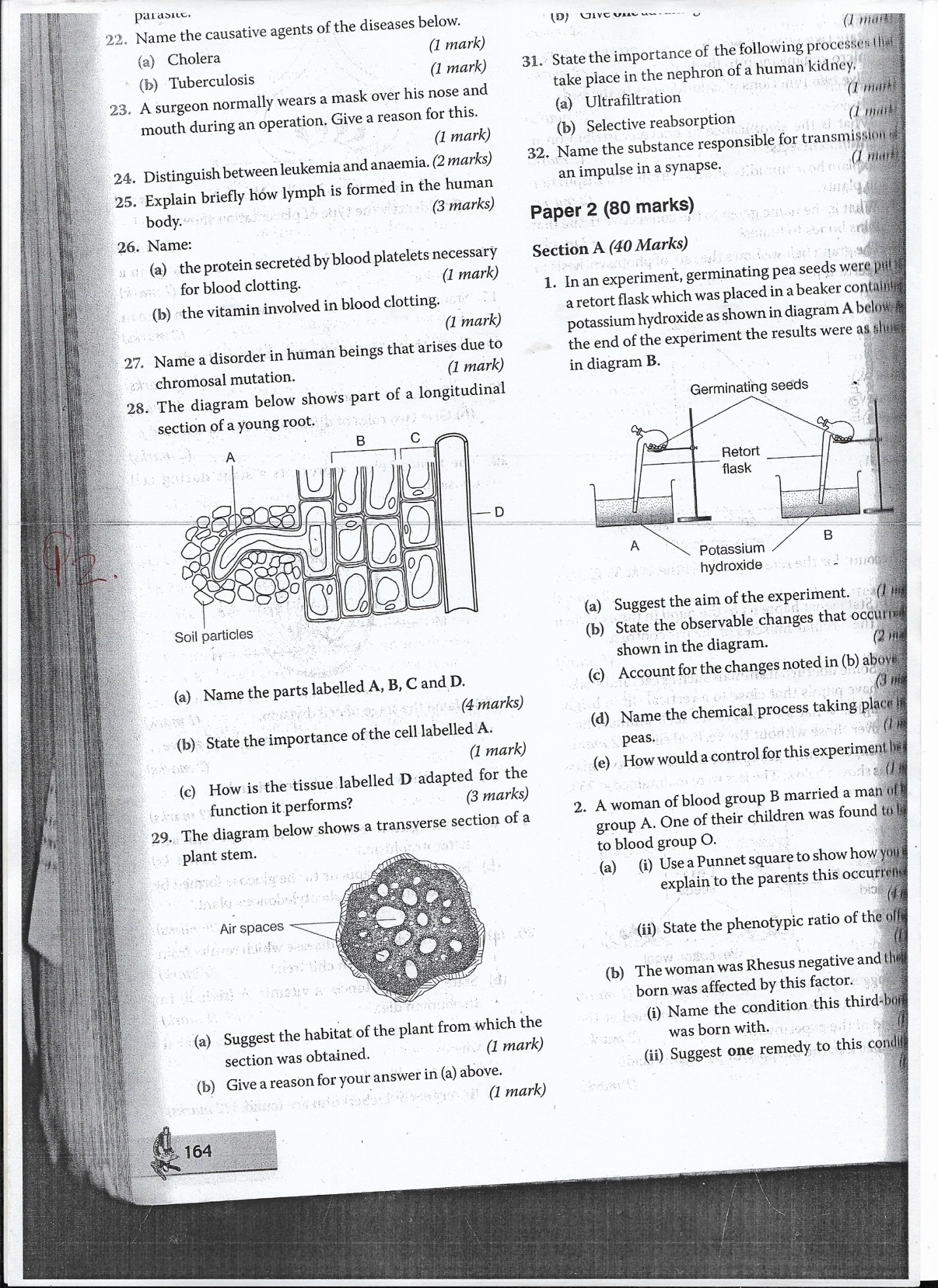
iii)………………………………………………. ………………………………………….

………………………………………………. ………………………………………….

c) Define the term mutation ………………………………………………………………………

……………………………………………………………………………………(1mk)

2. The diagram below shows part of a longitudinal section of a young root.



(a) Name he parts labeled A, B, C and D. (4mks)

A - C -

B - D –

(b) State the importance of the cell labeled A. (1mk)

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( c)How is the tissue labeled D adapted to the function it performs. (3mks)

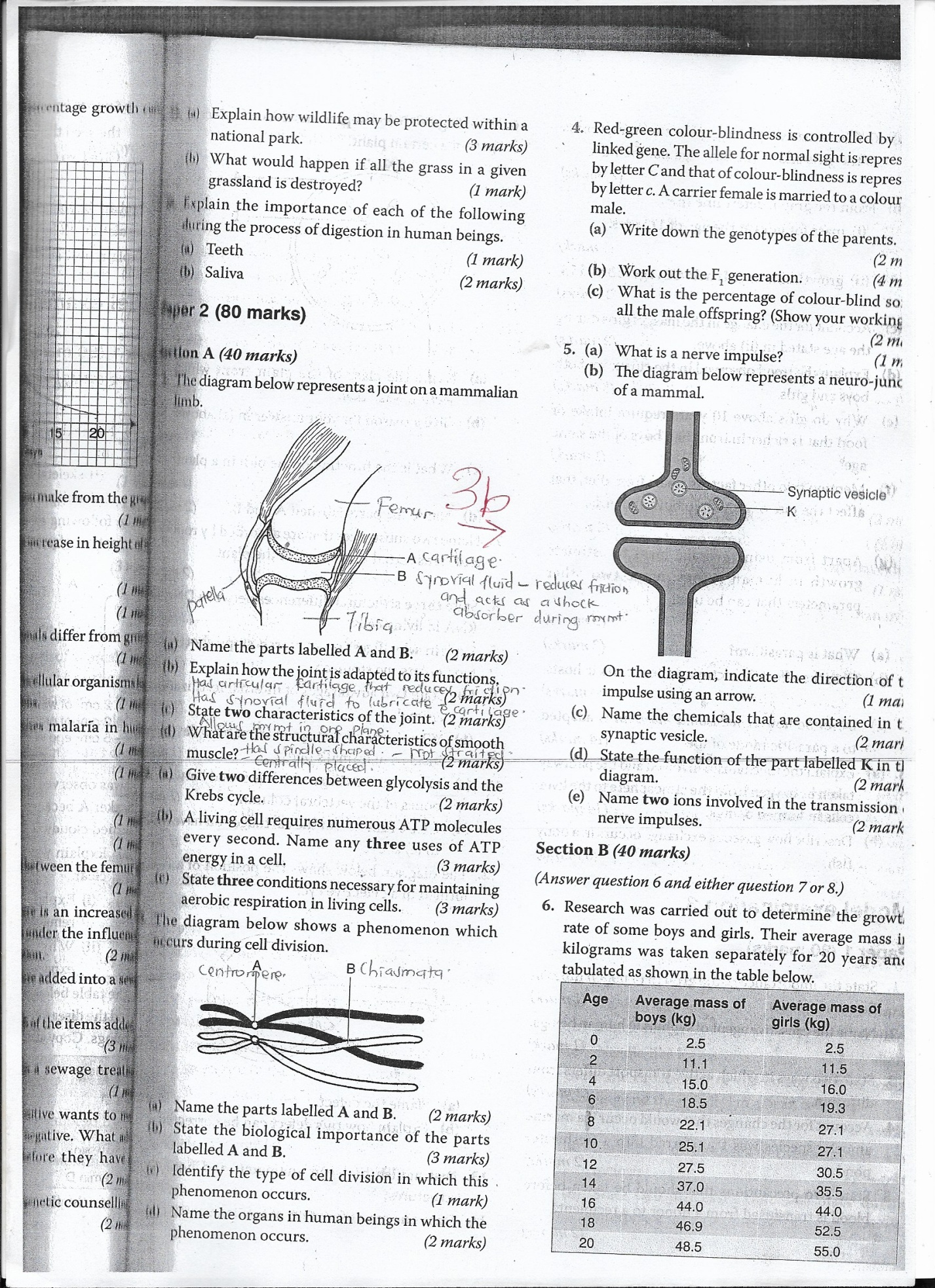
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3. a) What is a nerve impulse? (2mks)

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b) The diagram below represents a neuro-junction of a mammal.



On the diagram, indicate with an arrow the direction of impulse transmission. (1mk)

( c) Name the chemical substance that is contained in the synaptic vesicle. (1mk)

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(d) State the function of the part labeled K in the diagram. (1mk)

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(e) Name two mineral ions that are involved in the transmission of nerve impulses. (2mks)

(i)

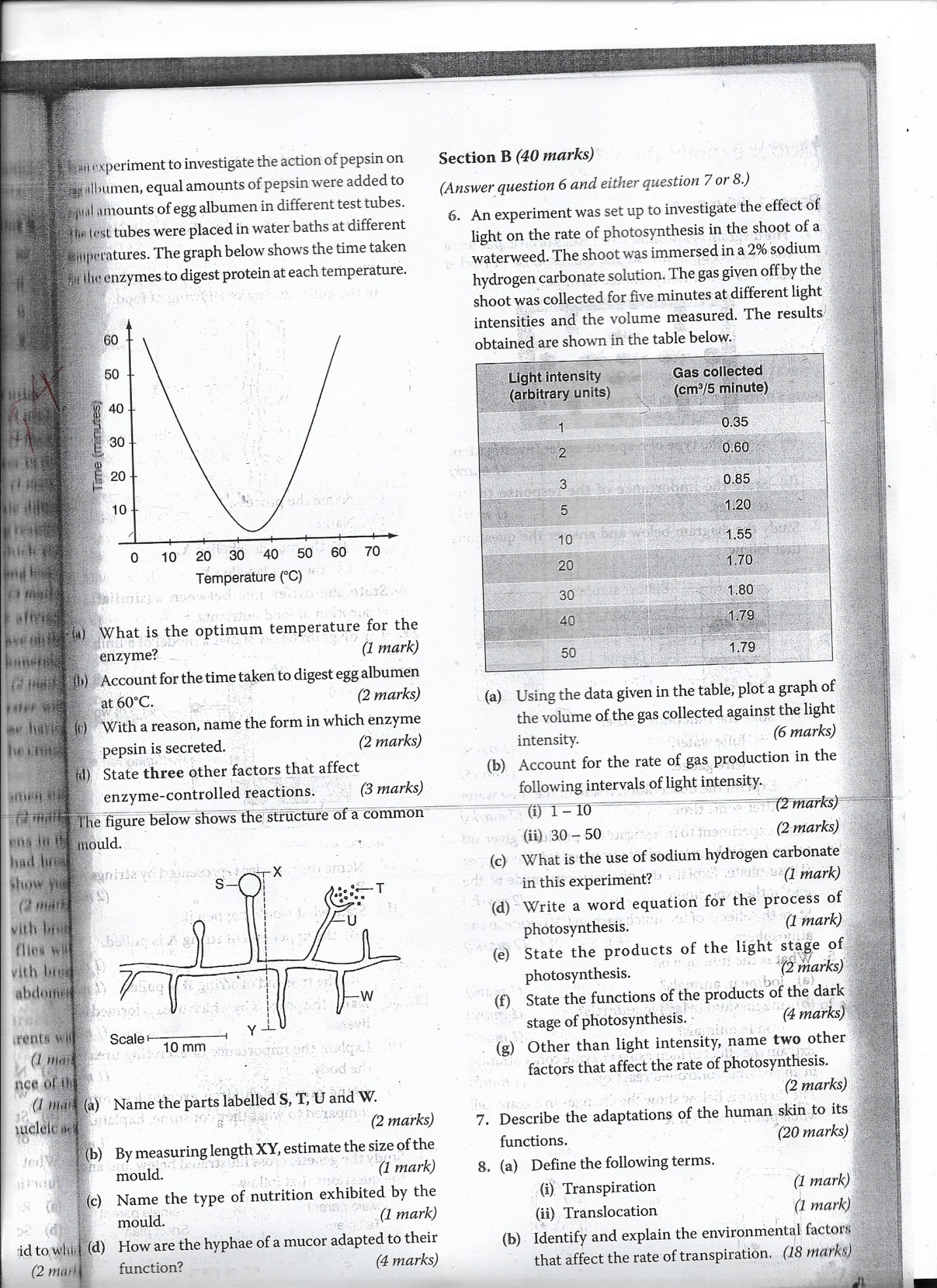
(ii)

4. In an experiment to investigate he action of pepsin on egg albumen, equal amounts of pepsin were

added to equal amounts of egg albumen in different test tubes. The test tubes were placed in water

baths at different temperatures. The graph below shows the time taken for the enzyme to digest protein

at each temperature.



(a) (i) What is the optimum temperature for the enzyme? (1mk)

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(ii) Account for the time taken to digest egg albumen at 600C. (2mks)

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(b) By giving a reason, name the form in which pepsin enzyme is secreted. (2mks)

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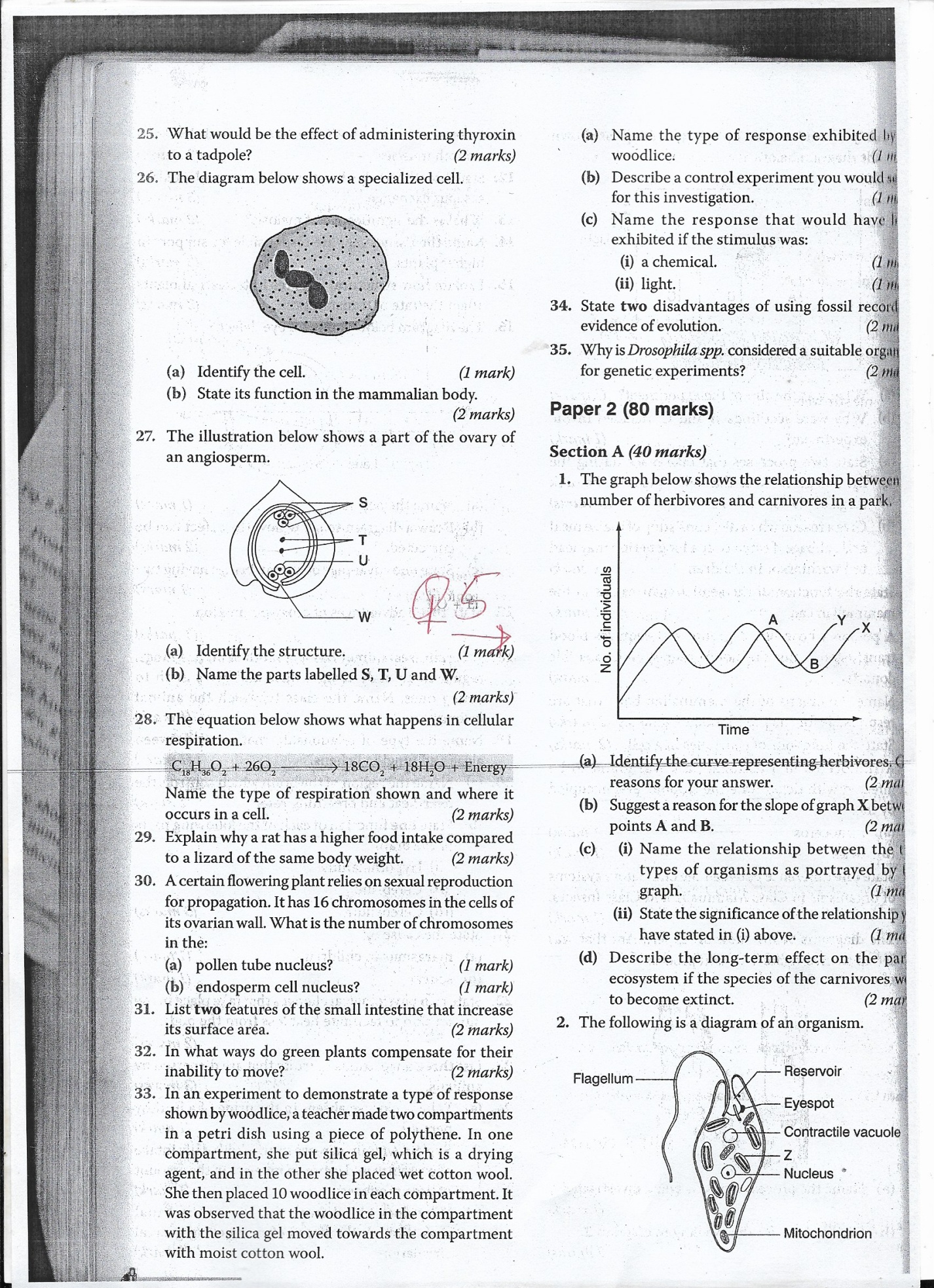
( c) State three other factors that affect enzyme controlled reactions. (2mks)

(i)

(ii)

(iii)

5. The graph below shows the relationship between the number of herbivores and carnivores in a park.



(a) Identify the cure that represent carnivores. Give a reason for your answer. (2mks)

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(b) Suggest a reason for the slope of curve X between points A and B. (2mks)

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( c) (i) Name the type of relationship that exist between herbivores and carnivores as indicated in

the graphs. (1mk)

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(ii) State the significance of the relationship you have stated in C(i) above. (1mk)

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(d) What will be the long term effect on the park ecosystem if all carnivores were eliminated from

the park. (1mk)

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**SECTION B (40MKS)**

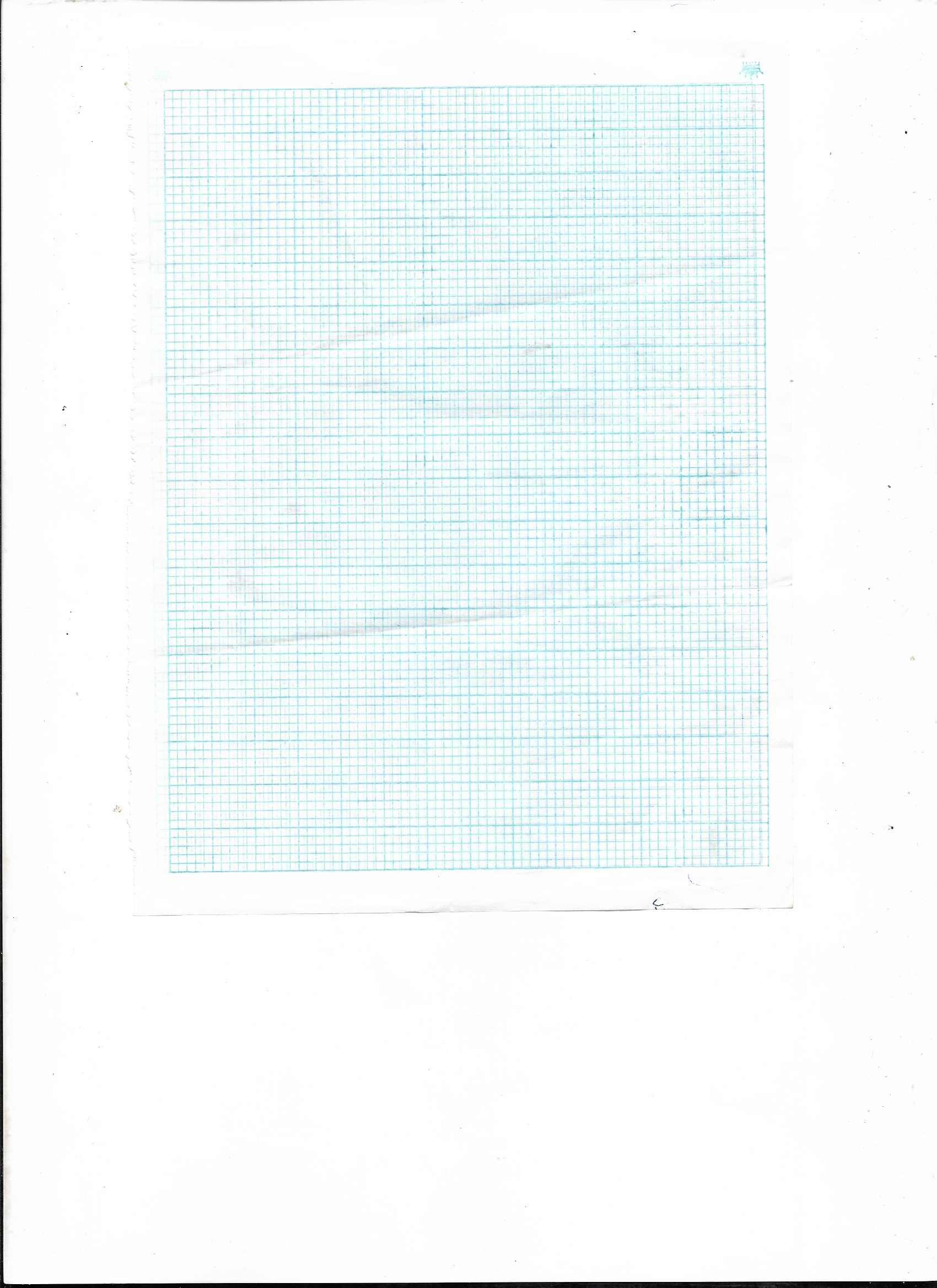
**Answer question 6(compulsory) in the spaces provided and either question 7 or 8 in the spaces provided after question 8.**

6. Research was carried out to determine the growth rate of some boys and girls. Their average mass in

Kilograms was taken separately for 20 years. Their weight are tabulated as shown in the table below.

|  |  |  |
| --- | --- | --- |
| Age | Average Mass of (Boys(Kg) | Average mass of girls Kg. |
| 0  2  4  6  8  10  12  14  16  18  20 | 2.5  11.1  15.00  18.5  22.1  25.1  27.00  37.00  44.00  47.0  48.5 | 2.5  11.5  16.0  19.3  27.1  27.2  30.00  36.00  44.00  52.00  55.00 |

(a) On the same axis, plot graphs of the average mass of the boys and the girls against their age. (7mks)



(b) From the graph, determine the

(i) Mass for boys at the age of 11 years. (1mk)

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(ii) Growth rate for girls between ages 13 and 15. (2mks)

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( c) Account for the change in the mass of girls during the age stated in (ii) above. (2mks)

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(d) Explain the trend observed in the curves for both boys and girls. (3mks)

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(e) Why do girls above 10 years require intake of food that is richer in iron than boys of the same

age? (1mk)

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(f) Name two other factors, apart from diet, that affect the rate of growth in boys and girls.

(2mks)

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(g) A part from using average mass to estimate growth in human beings, name two other

parameters that can be used. (2mks)

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7. a) What is homeostasis. (2mks)

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b) Discuss the homeostatic functions of the mammalian liver. (18mks)

8. Describe how xerophytes are adapted to their habitats. (20mks)