**TUNE UP EXAMS TERM1 APRIL /MAY 2022**

**FORM 2 BIOLOGY EXAM**

**TIME: 2 HRS**

**NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ADM:\_\_\_\_\_\_\_\_\_CL:\_\_\_\_\_\_\_\_\_\_**

**Answer all questions in section A, B and C in the spaces provided**.

**SECTION A: 40 (MARKS)**

1. List any two scientific skills that one develops while studying Biology. (2 mks)

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2. Name any two career which require background information in Biology. (2 mks)

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3. Name two environmental problem that the knowledge of Biology would help solve. (2mks)

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4. Name the equivalent of a phylum in kingdom Plantae (1mk)

………………………………………………………………………………………………………

5. Four organisms were classified using Binomial nomenclature as shown in the following table

|  |  |
| --- | --- |
| **Organisms** | **Name** |
| V | Drosophila melanogaster |
| W | Canis lupus |
| X | Rana temporaria |
| Y | Canis familiaris |

a i) Name two organisms that are closely related . (1mk)

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ii) Give a reason for your answer in (i) above. (1mk)

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b) State one reason why scientific names are in Latin (1mk)

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6. Name the kingdom to which the following organisms belong

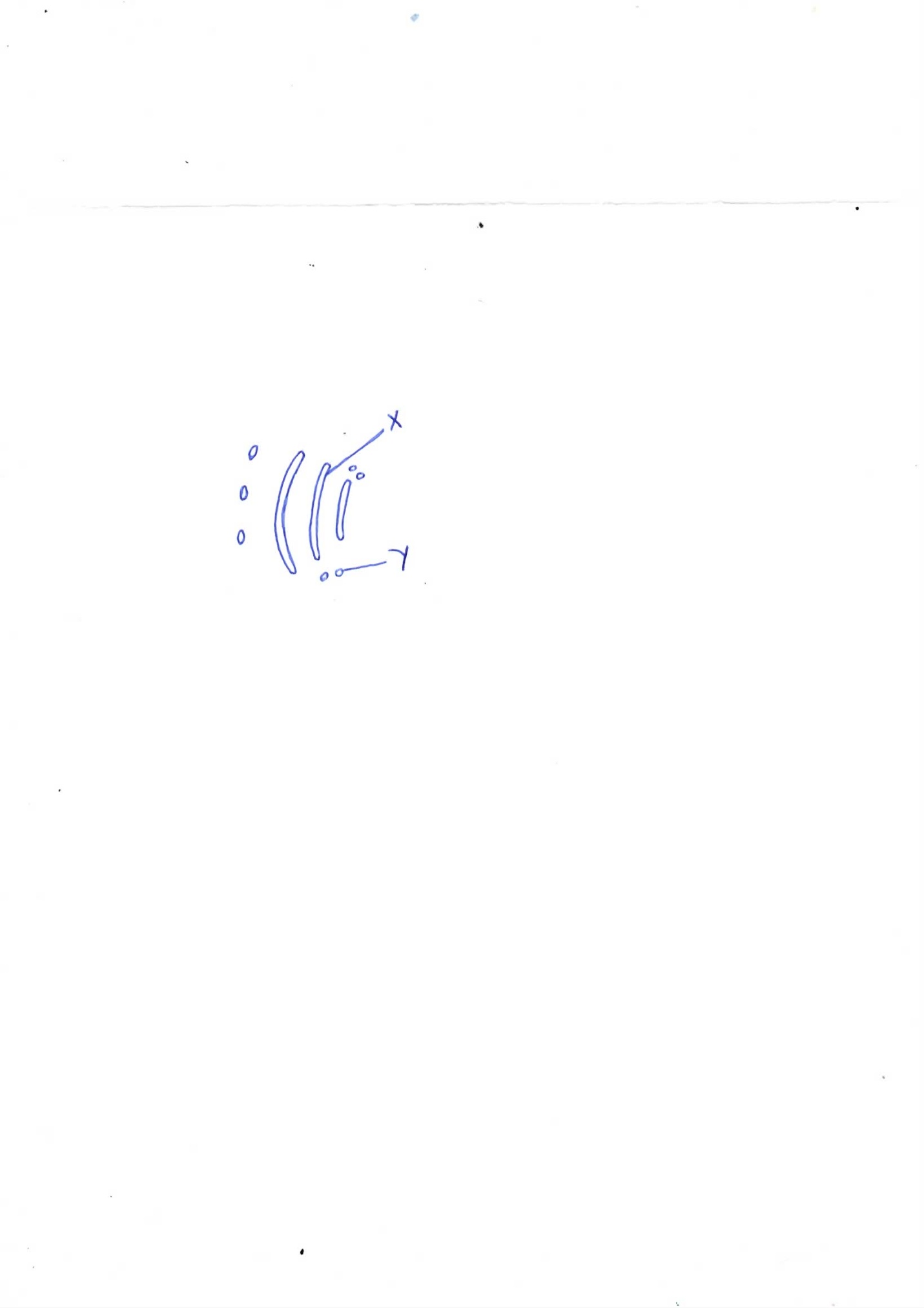
i) Amoeba (1mk)

………………………………………………………………………………………………………

ii) Bread mould (1mk)

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7. The following diagram represents an organelle of a cell.



a) Name the cell organelle (1mk)

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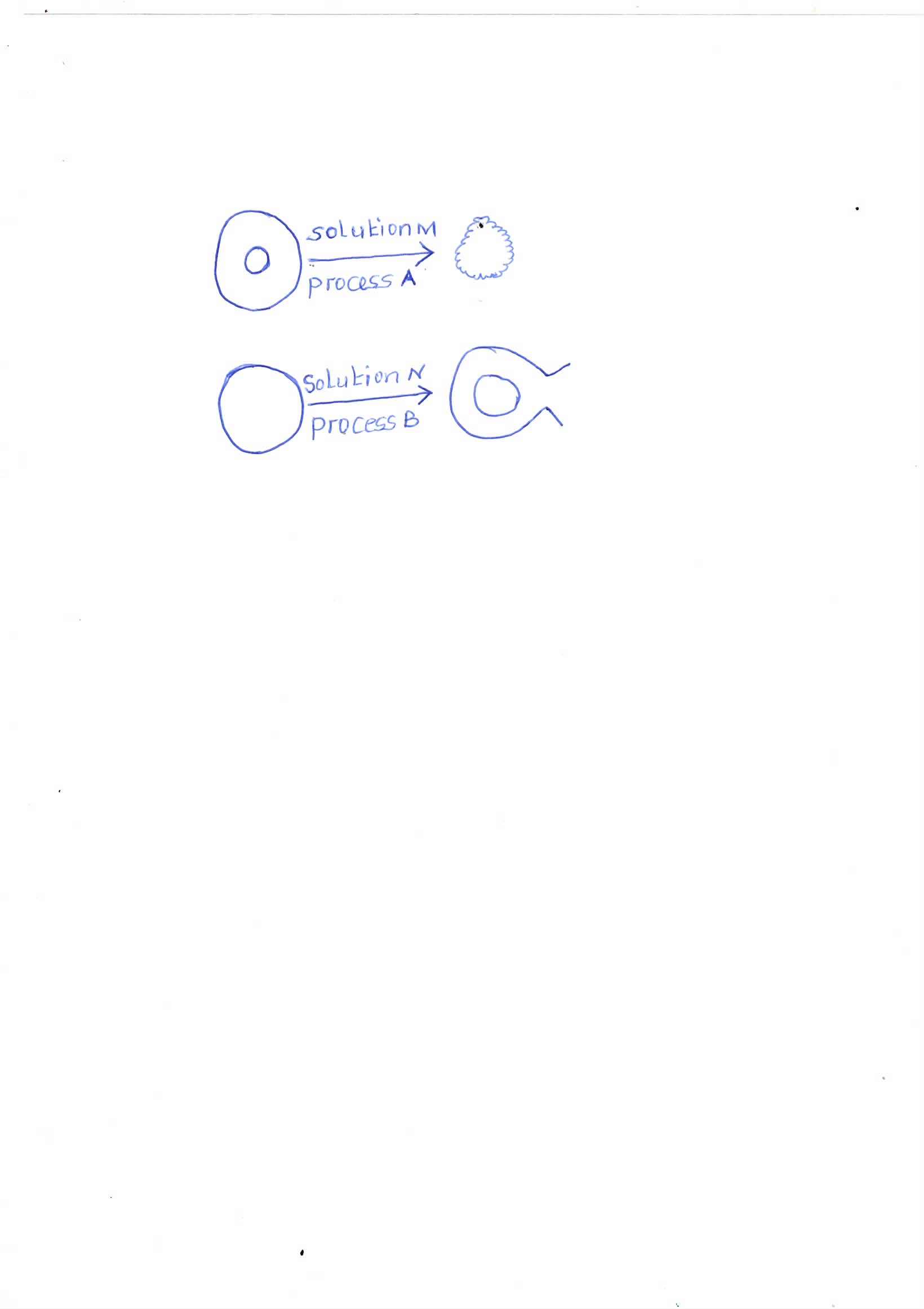
b) State two functions of the above organelle. (2mks)

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c) Name the parts labeled X and Y (2mks)

X:……………………………………………………………………………………………………Y:……………………………………………………………………………………………………

8. The diagrams below illustrate the behavior of red blood cells placed in two different solutions M and N



i) Suggest the nature of solutions M and N. (2mks)

M:……………………………………………………………………………………………………N:……………………………………………………………………………………………………

ii) Name the two processes represented by the letters A and B. (2mks)

A:……………………………………………………………………………………………………B:……………………………………………………………………………………………………

9. State two roles played by active transport in living organisms. (2mks)

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10. Describe what happens during the light stage of photosynthesis. (2mks)

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11. Sharon ate rice and beans for breakfast .

(a) State the physical and chemical process that occurred in the mouth cavity (2mks)

Physical

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Chemical

………………………………………………………………………………………………………………………………………………………………………………………………………………

(b) Name the enzymes that will digest the food in;

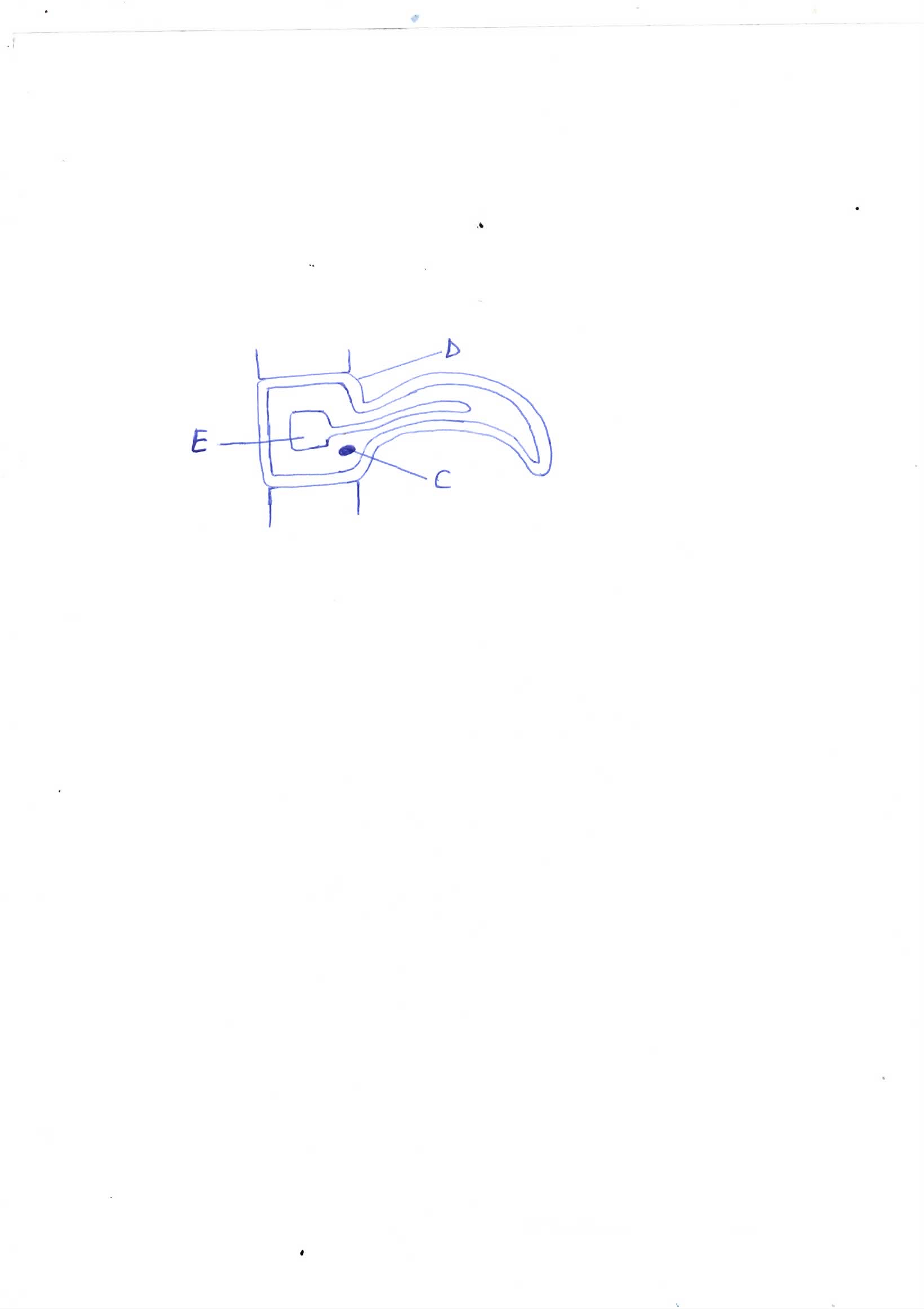
(i) The mouth cavity (1mk)

………………………………………………………………………………………………………

(ii) The stomach (1mk)

………………………………………………………………………………………………………

12. The diagram below shows a specific plant cell



a)(i) Name the cell (1mk)

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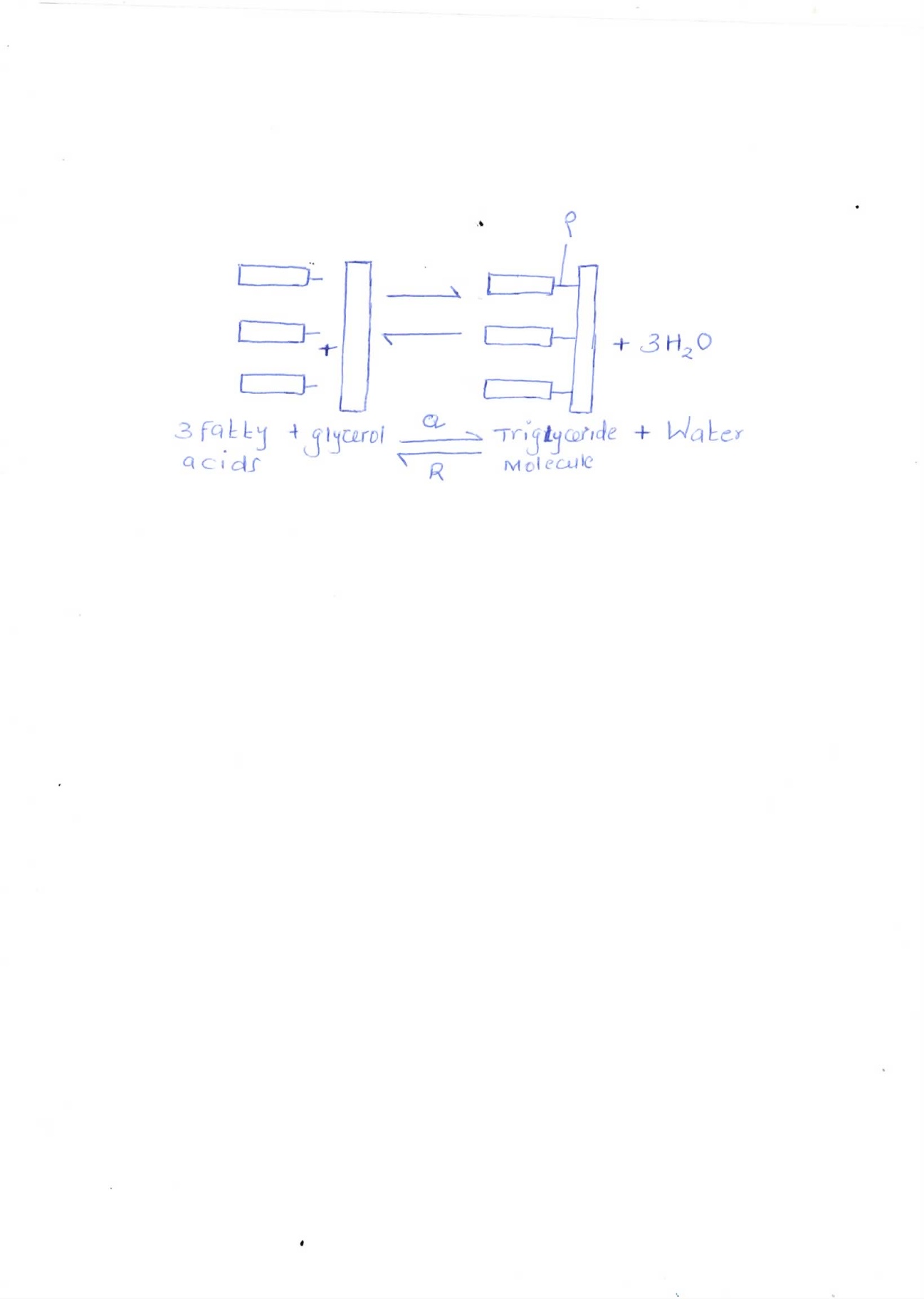
(ii) Name the parts labeled D and E (2mks)

D:……………………………………………………………………………………………………E:……………………………………………………………………………………………………

b) State the function of part labeled C (1mk)

………………………………………………………………………………………………………………………………………………………………………………………………………………

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



a) Identify bond P (1 mk)

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b) Process labeled Q and R (2 mks)

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14. The chemical equation for photosynthesis below is incomplete.

Water + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy Glucose + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Plant pigment

a) Complete the equation using words. (2 mks)

b) State the source of energy used to drive this reaction. (1 mk)

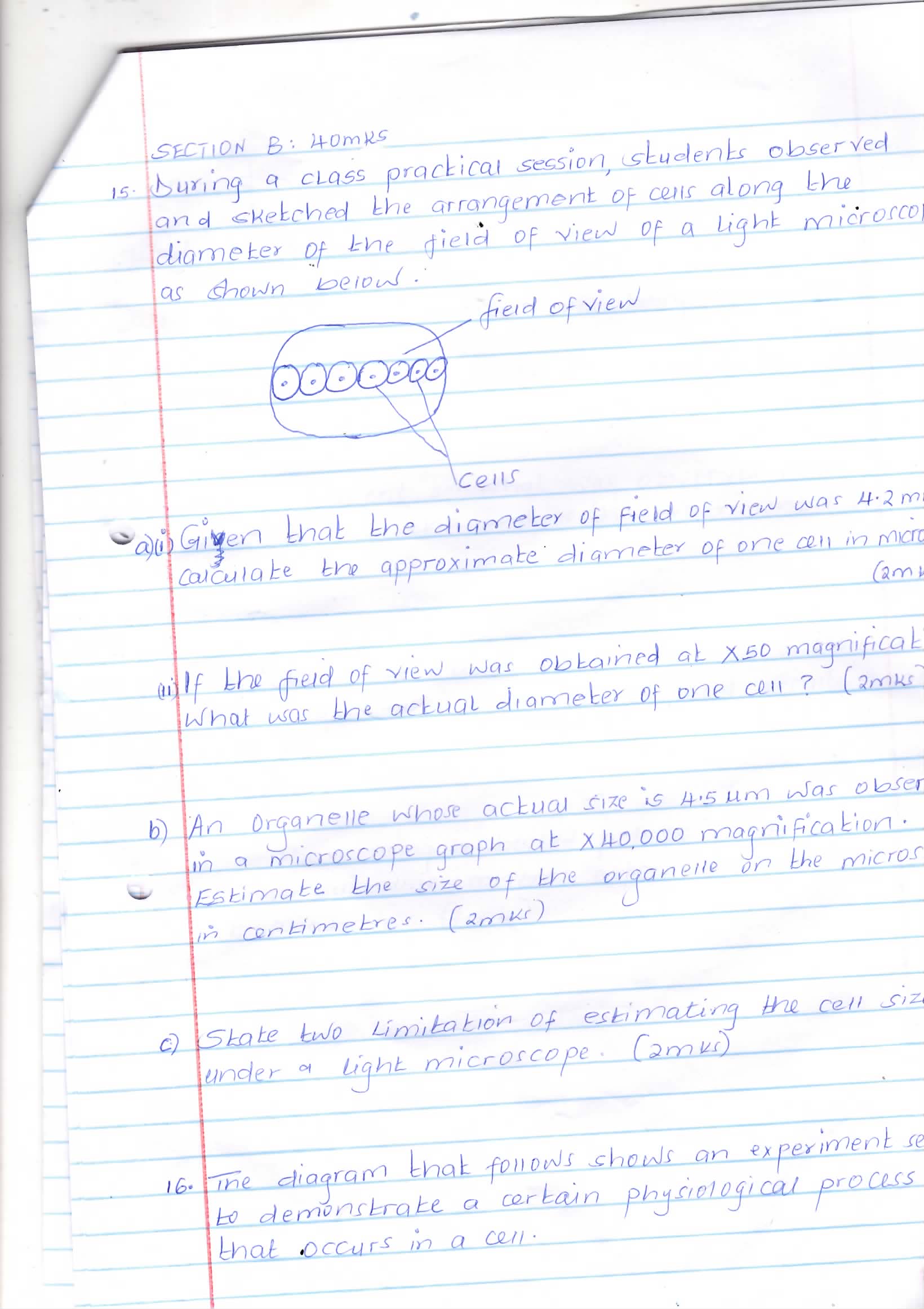
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c) Name the pigment in plants necessary for this reaction. (1 mk)

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**SECTION B: (40 MARKS)**

15. During a class practical session, students observed and sketched the arrangement of cells along the diameter of the field of view of a light microscope as shown below.



a)i) Given that the diameter of field of view was 4.2 mm calculate the approximate diameter of one cell in micrometers. (2 mks)

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ii) If the field of view was obtained at x50 magnification what was the actual diameter of one cell?

(2 mks)

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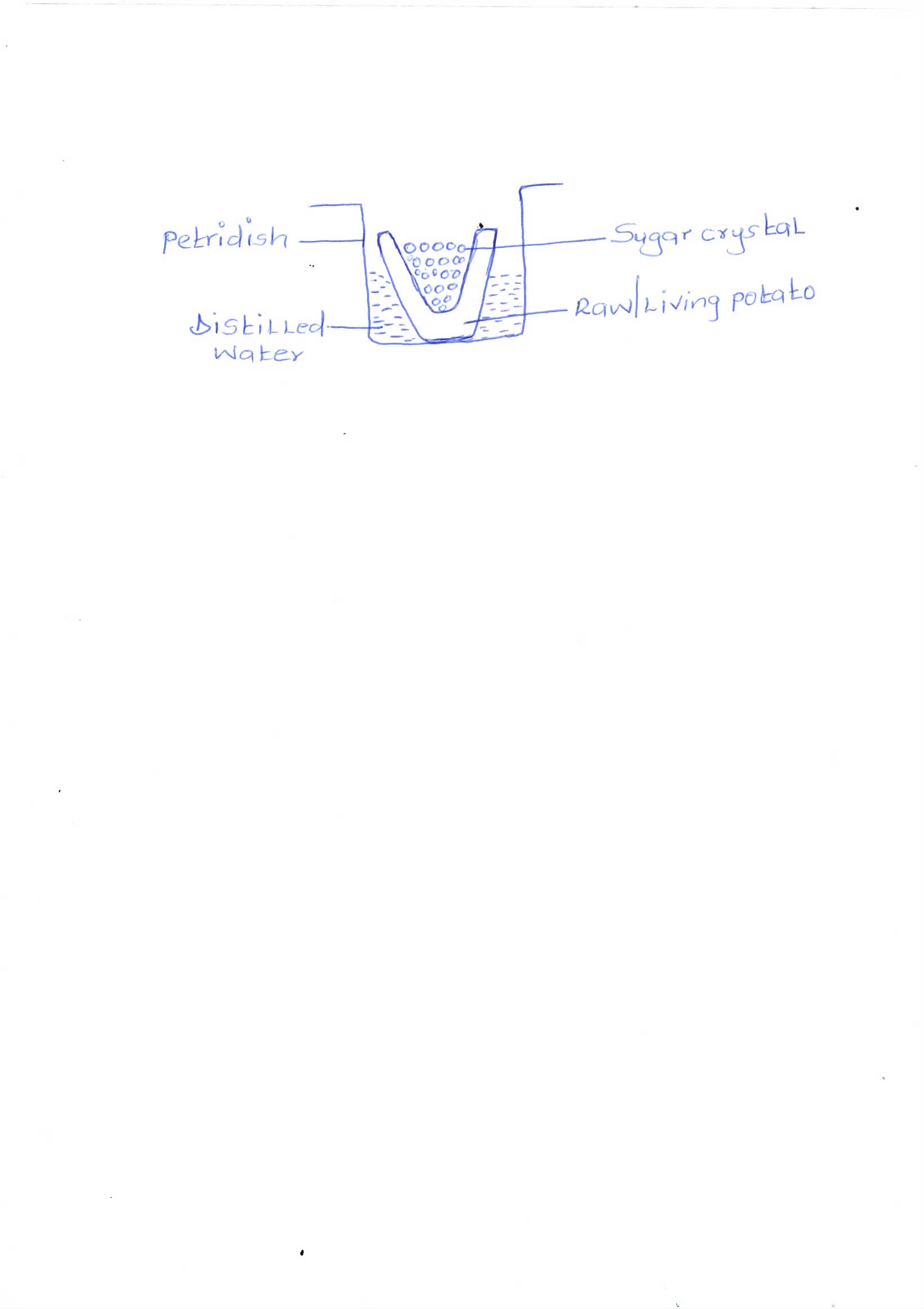
b) An organelle whose actual size is 4.5 um was observed in a microscope graph at 40,000 magnification. Estimate the size of the organelle on the microscope in centimeters. (2 mks)

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c) State two limitation of estimating the cell size under a light microscope. (2 mks)

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16. The diagram that follows shows an experiment set up to demonstrate a certain physiological process that occurs in a cell



a) What physiological process was being investigated? (1 mk)

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b) What happened to the level of water in the petridish at the end of the experiment? (1 mk)

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c) Briefly comment on what was observed in the potato cup at the end of the experiment. (3 mks)

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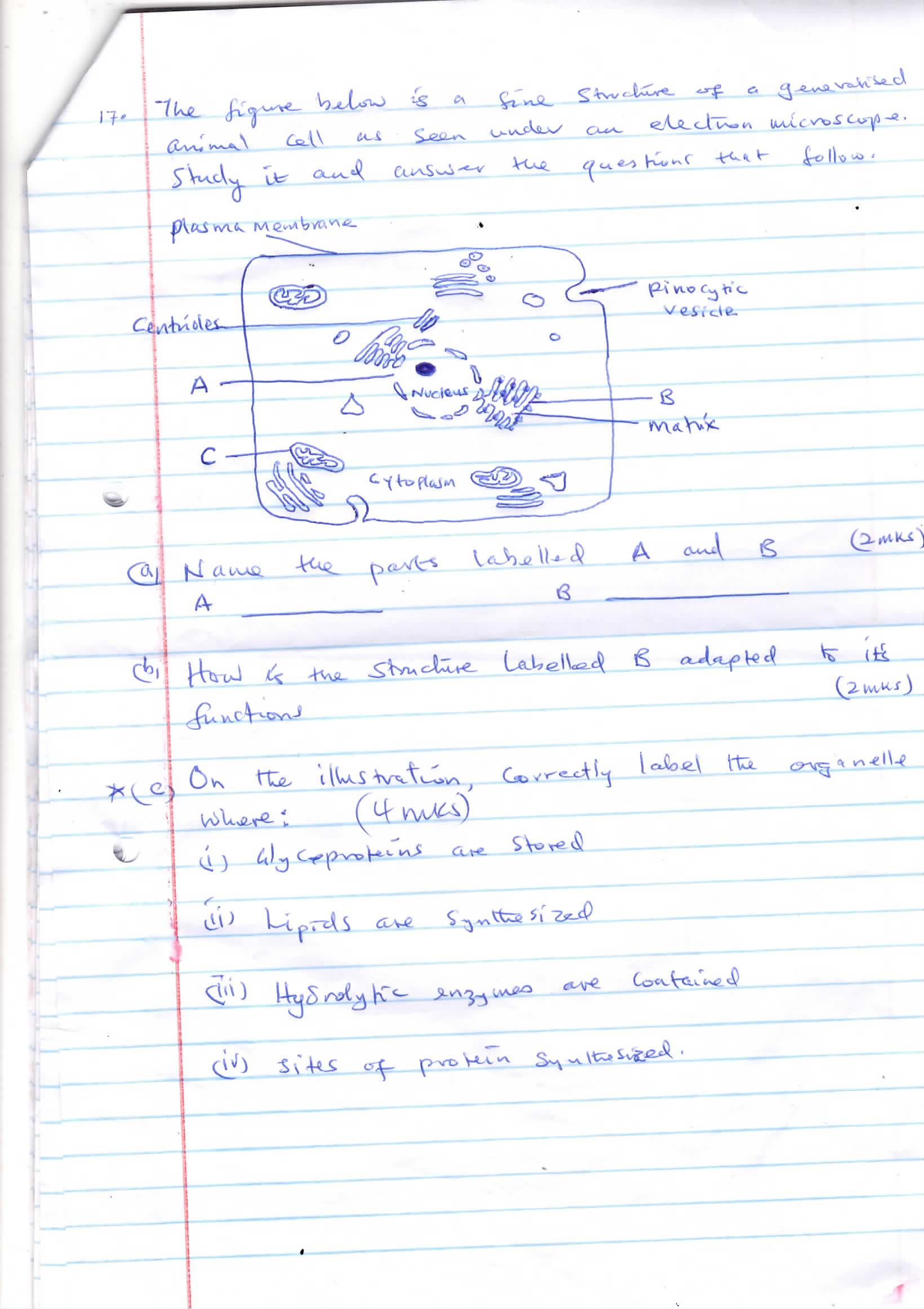
d) A similar experiment was set up using a boiled potato tissue. Suggest the expected results that would be obtained. (2 mks)

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e) Other than using a boiled potato tissue suggest another suitable control experiment for the set up above. (1 mk)

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17. The figure below is a fine structure of a generalized animal cell as seen under an electron microscope. Study it and answer the questions that follow.



a) Name the parts labeled A and B. (2 mks)

A:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ B:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) How is the structure labeled C adapted to its functions? (2 mks)

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c) Name the organelle where:- (4 mks)

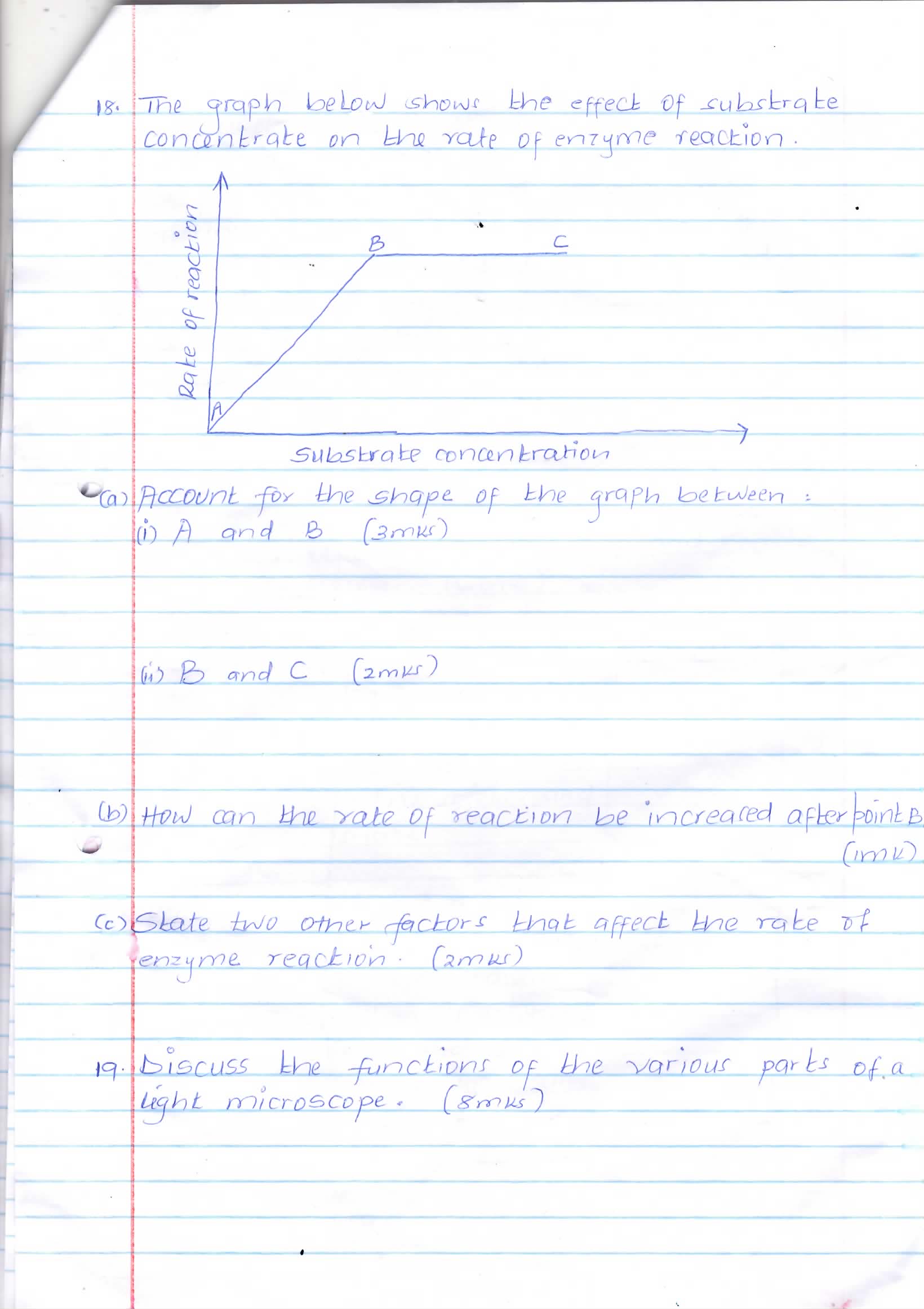
i) Glycoproteins are stored.

ii) Lipids are synthesized

iii) Hydrolytic enzymes are contained

iv) Proteins are synthesized.

18. The graph below shows the effect of substrate concentration on the rate of enzyme reaction.



a) Account for the shape of the graph between:

i) A and B (3 mks)

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ii) B and C (2 mks)

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b) How can the rate of reaction be increased after point B? (1 mk)

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c) State two other factors that affect the rate of enzyme reaction. (2 mks)

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19. Discuss the functions of the various parts of a light microscope. (8 mks)

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**SECTION C: (20 MARKS)**

20. A solution containing egg albumen and glucose was prepared and labeled as solution M.

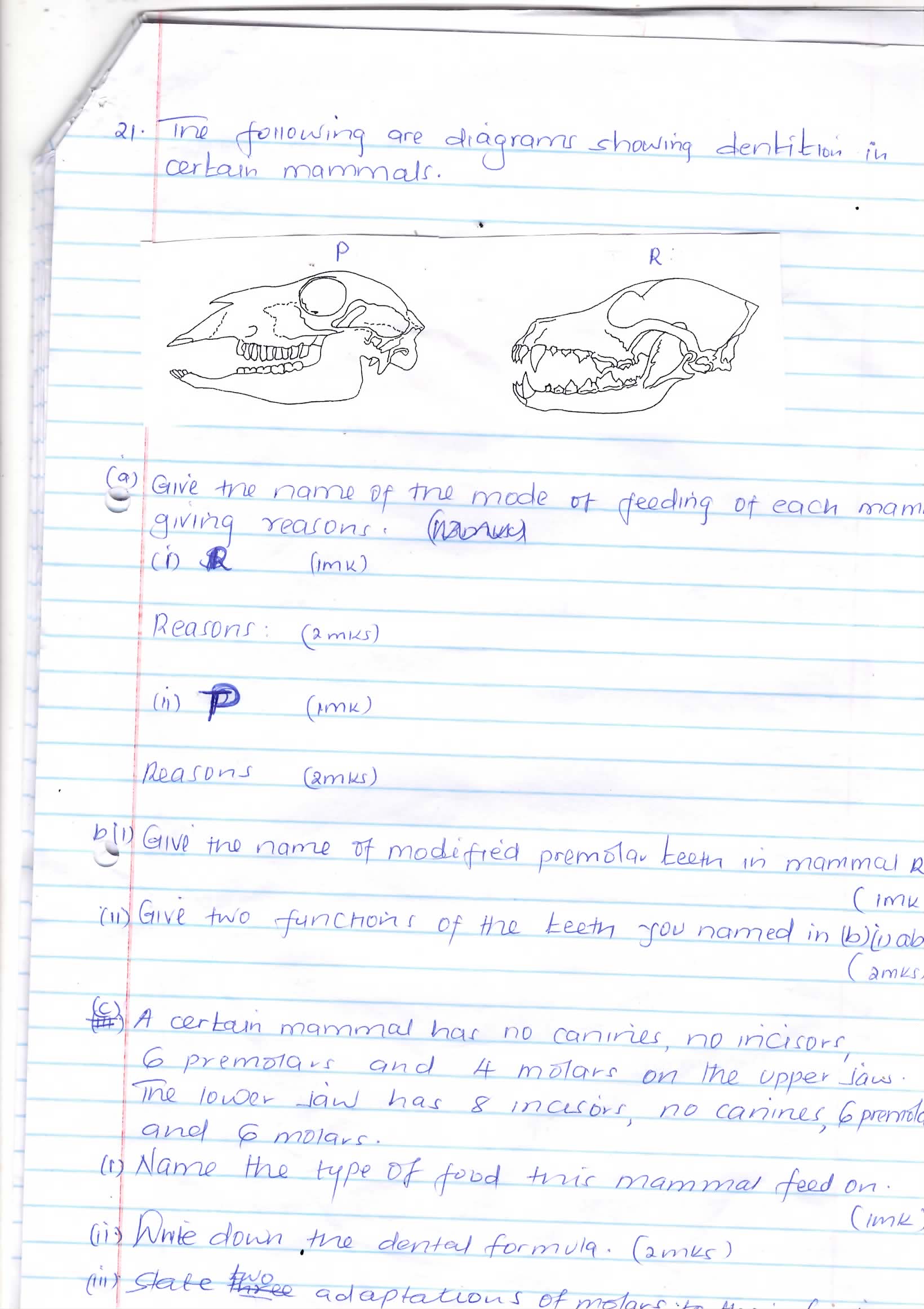
A form one student was provided with the following reagents and apparatus to carry out food test.

* Iodine solution
* Sodium hydroxide solution
* Copper (II) sulphate solution
* Benedict’s solution
* Test tubes
* Measuring cylinder
* Source of heat

Record the expected observations and conclusions in the table below. (6 mks)

|  |  |  |  |
| --- | --- | --- | --- |
| **Food substance** | **Procedure** | **Observations** | **Conclusions** |
| i) Starch | To 2 cm3 of solution M in a test tube , add few drops of iodine solution and shake |  |  |
| ii) Proteins | To 2 cm3 of solution M is a test tube, add 2 cm3 sodium hydroxide solution, shake and add copper sulphate solution dropwise. |  |  |
| iii) Reducing sugars | To 2 cm3 of solution M in a test tube, add an equal amount of Benedict’s solution and boil the mixture. |  |  |

21. The following are diagrams showing dentition in certain mammals.



a) Give the name of the mode of feeding of each mammal giving reasons.

i) P: ……………………………………………………………….. (1 mk)

Reasons: (2 mks)

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ii) R:……………………………………………………………………. (1 mk)

Reasons: (2 mks)

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b) Give the name of modified premolar teeth in mammal R. (1 mk)

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ii) Give two functions of the teeth you named in (b) above. (2 mks)

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c) A certain mammal has no canines, no incisors, 6 premolars and 4 molars on the upper jaws. The lower jaw has 8 incisors, no canines, 6 premolars and 6 molars.

i) Name the type of food this mammal feed on. (1 mk)

……………………………………………………………………………………………………

ii) Write down the dental formula. (2 mks)

………………………………………………………………………………………………………

iii) State two adaptations of molars to their function. (2 mks)

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