

1. In a prolonged drought period, forage was scarce. It made animals reach out for higher forage and this way the giraffe got the stretched long necks.

(a) What is the term used for a characteristic such as the long necks outlined? (1 mark)

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(b) What is the name given to the theory that describes the evolution of such structures like the long necks? (1 mark)

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(a) Explain the limitation of the theory you named in (b) above. (1marks)

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2. (a) Name the opening to the chamber of the heart of an insect (1 mark)

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(b) Name the tissue in plants responsible for:

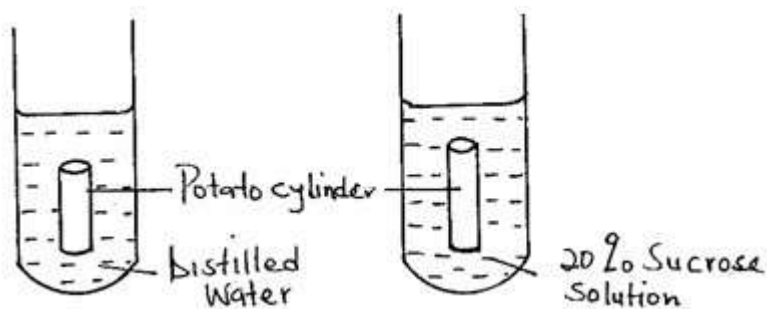
(i) Primary growth. (1 mark)

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(ii) Secondary growth. (1 mark)

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3. Two potato cylinders were carefully dried on a blotting paper and weighed. Each piece weighed 2 grams. One was placed in each test tube as shown in the diagram below.



(a) After 48hrs, which potato cylinder will be heavier. Explain. (2 marks)

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(b) Name the substance whose movement was responsible for the weight changes in the potato cylinder you identified in (a) above. (1 mark)

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(c) Name the process which was responsible for the movement of the substance identified in (b) above. (1 mark)

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4. Why are the following steps taken when preparing across section of a leaf for viewing under the microscope?

(a) Cutting thin section. (1 mark)

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(b) Placing the section in water. (1 mark)

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5. a) Salivary amylase does not digest starch in the stomach. Give a reason. (1mark)

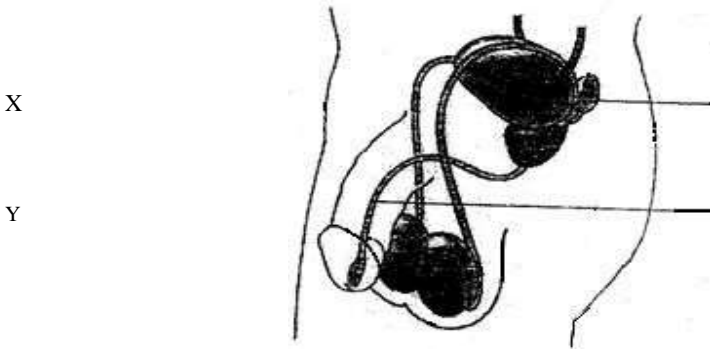
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b) Name any two digestive enzymes secreted by the pancreases (2 mks)

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6. a) The diagram shown below represents a male reproductive system.



(a) Name the structure labelled **X**.....(1mk)

(b) Name **one** substances that pass through structure labelled **Y**..... (1mk)

7. The table below shows approximate numbers of organisms found in an ecosystem.

Type of organism	Numbers
Grasshoppers	Many
Hawks	3 – 4
Snakes	15 – 30
Green plants	Very many
Lizards	80 – 120

(a) Using the information in the table draw a pyramid of numbers. (2 marks)

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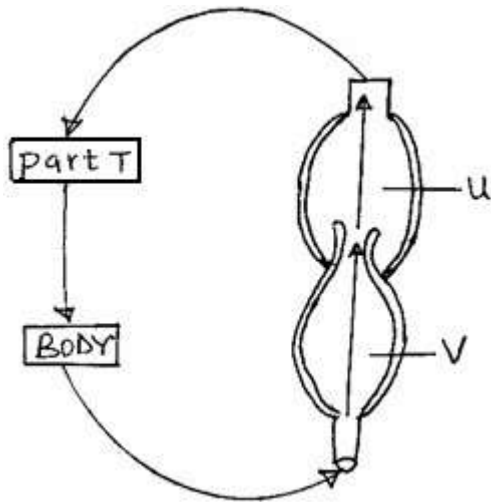
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(b) Explain what would happen to the other organisms if all the lizards suddenly died off. (1 marks)

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8. The diagram below show single circulation a fish.



(a) Write down the names of the parts labelled U and V. (2 marks)

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(b) Explain the main disadvantage of this type of circulation. (1 mark)

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9. State the role of each of the following processes. (2marks)

a) Guttation.....

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b) Root pressure.....

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10. (a) Give one external feature that distinguishes an earthworm from a round worm .(1 mark)

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(b) Name the phylum to which each belongs

Earthworm(1mark)

Roundworm(1mark)

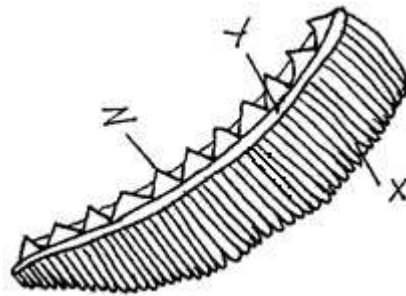
11. The table below shows differences in air breathed in and out.

Gas	Volume of air breathed in	Volume of air breathed out
Oxygen	21.00	16.00
Carbon (IV) oxide	0.04	4.00

a) What is the reason for these differences. (1 marks)

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b) The diagram below represents an organ of gaseous exchange.



i) What is the name of the organ? (1 mark)

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ii) State **one** way in which structure **X** is adapted for gaseous exchange. (1 marks)

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12. Explain how the following are adapted to their functions

a) Guard cells (1mark)

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b) Aerenchyma tissue (1mark)

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13. (a) A sheep weighing 20kg requires 216KJ while a rat weighing 54gms requires 2830KJ per day. Explain. (2 marks)

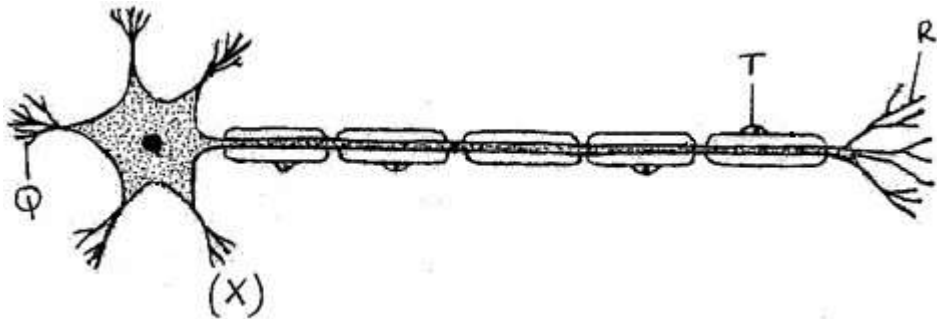
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(b) What is the role of mitochondrion in respiration? (1mark)

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14. The diagram below represents the structure of a nerve cell.



(a) Identify the nerve cell. (1 mark)

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(b) Give a reason for your answer in (a) above. (1 mark)

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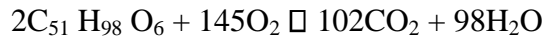
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(c) State the function of the part labelled T. (1 mark)

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(d) Using an arrow show the direction of an impulse on the diagram. (1 mark)

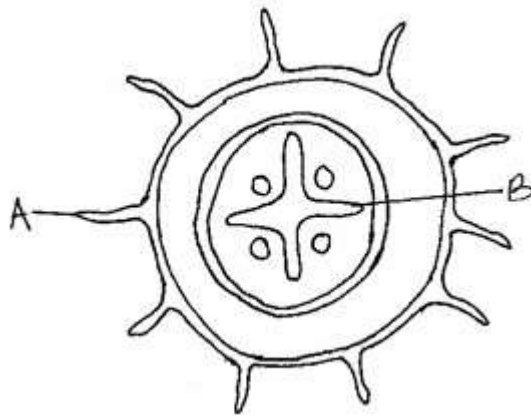
15. A food substance called tripalmitin $C_{51}H_{98}O_6$ was oxidized fully and the following equation worked out.



- (a) Calculate the RQ of tripalmitin. (2 marks)
- (b) From the RQ value obtained above, to what group of food substances does tripalmitin belong. (1 mark)

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16. The diagram below represents a cross section obtained from a plant. Use it to answer the questions that follow.



- (a) From which part of the plant was the section obtained from: (1 mark)
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- (b) Give a reason for your answer in (a) above. (1 mark)
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- (c) Name part **B**. (1 mark)
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- (d) Name the material that strengthens the part you named in (c) above. (1 mark)

17. (a) Given a sample of urine, name one test you would carry out to determine if it was obtained from a person suffering from diabetes mellitus. (1 mark)

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(b) What results are expected if one is diabetic?

(2 marks)

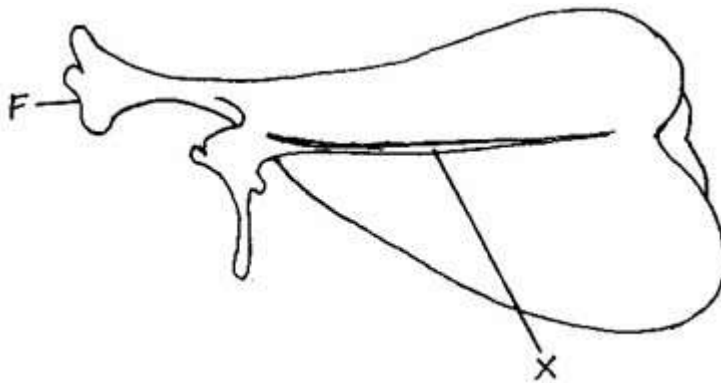
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18. The diagram below represents a bone of a mammal.



(a) Identify the bone.

(1 mark)

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(b) Name the part marked **X**.

(1 mark)

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(c) Name the bone that articulates at the part labelled **F**.

(1 mark)

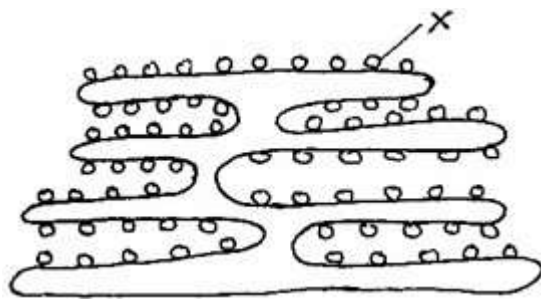
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(d) Explain one way in which the bone is adapted to its function.

(1 mark)

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19. The diagram below represents a cell organelle.



(i) Name the organelle above. (1 mark)

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(ii) Identify the structures labelled **X** and state its functions. (2 marks)

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20. State the name given to the study of :

a) Structure of living things.....(1mark)

b) Body functions.....(1mark)

21. Outline **two** pieces of evidence that support the theory of evolution (2mks)

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22. A cross between a red flowered plant and white flowered produced plants with pink flowers. Using letter R to represent the gene for red colour and W for white colour.

a) What were the parental genotypes.....(1mark)

b) Workout a cross between F1 plants (3marks)

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c) Give the phenotypic ratio of F₂ plants (1mark)

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d) Name a characteristic in humans, which is controlled by multiple genes (1mark)

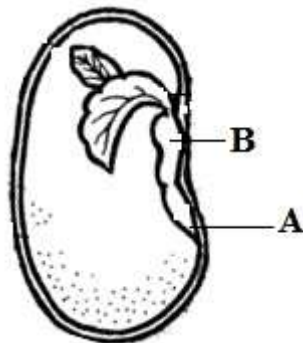
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23. State the functions of the following parts of human ear. (2marks) a) Ear ossicles

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b) Cochlea

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24. The diagram below shows the internal structure of a broad bean seed. Study it and answer the questions that follow.



a) Name the part labeled **B**. (1mark)

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b) Why is it important that the part labeled **A** develops first during germination? (1mark)

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25. The reaction represented by equation below occurs in the human body Hydrogen peroxide



(a) Name enzyme **Z** (1mark)

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(b) Name an organ in the human body where this reaction occurs (1mark)

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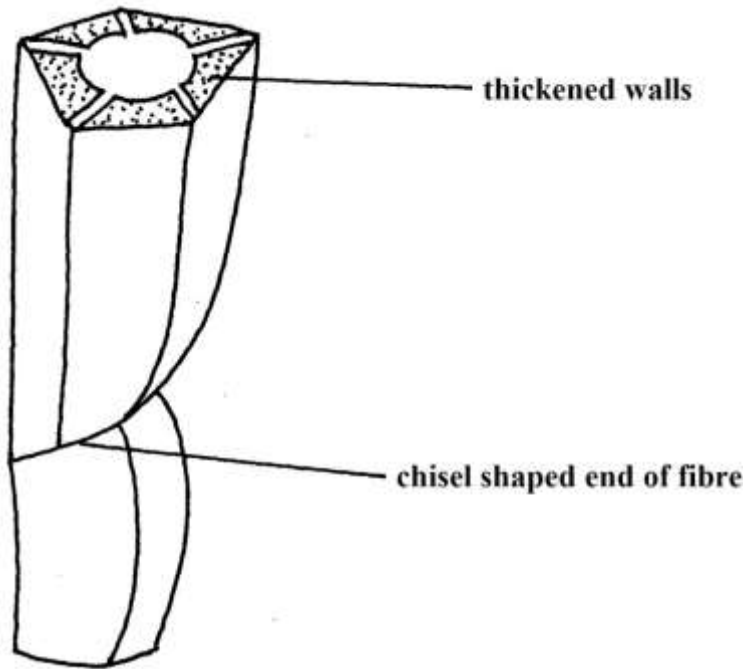
(c) State the biological importance of the reaction above (1mark)

26. (a) State the roles of light in plant nutrition. (2marks)

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(b) Give a reason why glucose formed at the end of photosynthesis is converted at once into starch. (1mark)

27. The diagram below shows a plant supportive tissue



(a) Identify the tissue (1mk)

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(b) State two similarities between tissue named in 9(a) above and one conducting water in dicotyledonous plant. (2mks)

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