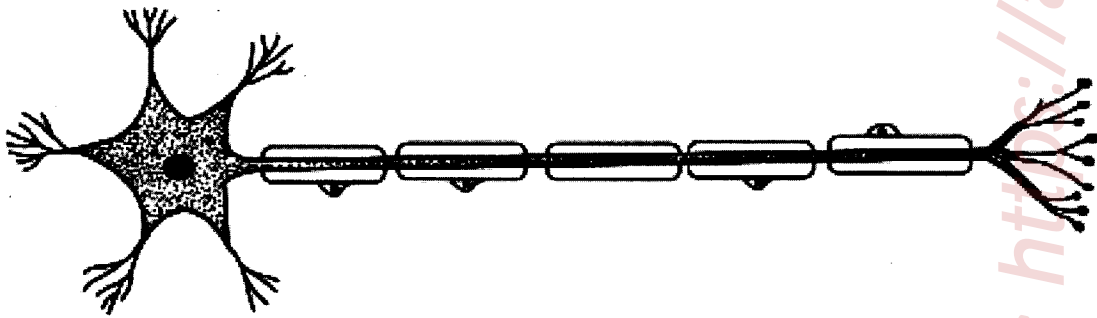


4.3 BIOLOGY (231)

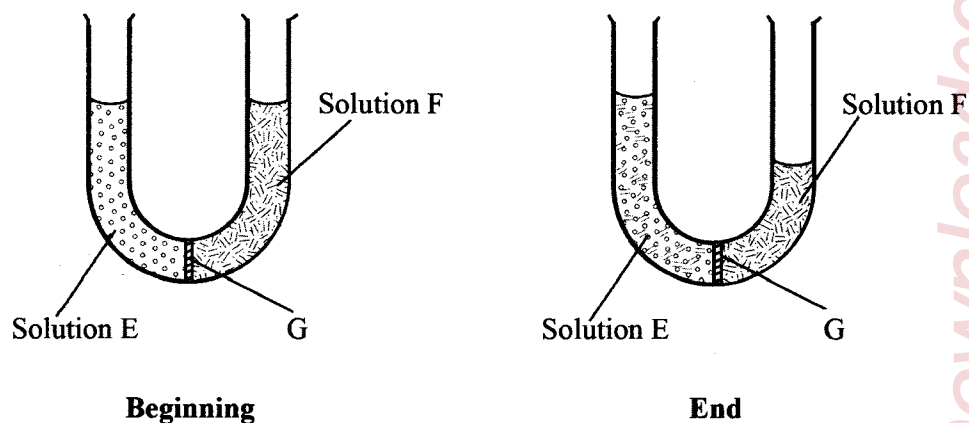
4.3.1 Biology Paper 1 (231/1)

Answer all the questions in the spaces provided.

1. Name the characteristic of living organisms illustrated by each of the activities described below:
 - (a) Dressing heavily (1 mark)
 - (b) Bursting of the sporangium in the *Rhizopus sp* (1 mark)
2. (a) Besides venation, state **two** other external characteristics of leaves that can be used to classify plants. (2 marks)
(b) Explain why the bat is classified as a mammal yet it flies. (2 marks)
3. The diagram below illustrates a specialised cell obtained from a certain tissue.



- (a) Name the cell. (1 mark)
 - (b) State **two** ways in which the cell is structurally adapted to its function. (2 marks)
4. In investigating a certain physiological process, students set up the apparatus as shown below and made the observations after 30 minutes as illustrated.



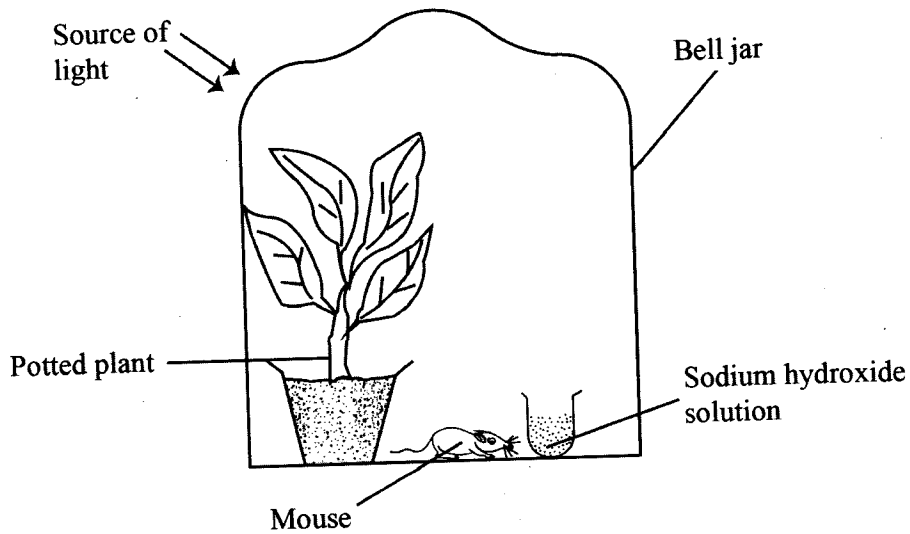
- (a) Name the physiological process being investigated. (1 mark)

- (b) Account for the observation made at the end of the experiment. (3 marks)
- (c) State the likely identity of G. (1 mark)
5. Explain why significantly increasing the blood pH slows down the rate of selective reabsorption of materials in the kidney tubules. (3 marks)
6. (a) Name the respiratory structure in the amoeba. (1 mark)
- (b) Give a reason for your answer in (a) above. (1 mark)
7. Distinguish between chemical and mechanical digestion. (1 mark)
8. State the role of each of the following in the mammalian respiratory system:
- (a) mucus (2 marks)
- (b) cartilage rings (1 mark)
- (c) epiglottis (1 mark)
9. Below is a photograph of *Brassica oleracea*, Sukuma wiki leaf.



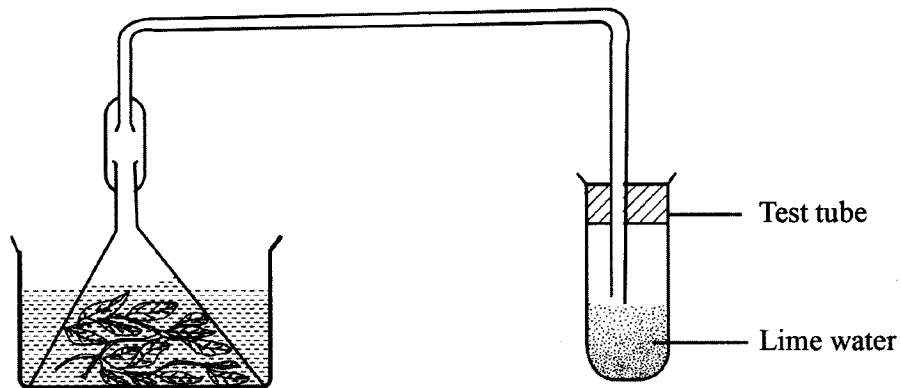
- (a) State **two** observable features that adapt the leaf to gaseous exchange. (2 marks)
- (b) Explain the relationship between photosynthesis and aerobic respiration within the leaf. (2 marks)

10. In an investigation, students set up the apparatus below in the laboratory and made observations after 72 hours.



- (a) Explain how inclusion of the following components would affect the mouse in the experiment:
- (i) light (2 marks)
 - (ii) sodium hydroxide solution (2 marks)
- (b) State why the students preferred to use a bell jar and **not** a tin box in the experiment. (1 mark)
11. Explain each of the following physiological observations:
- (a) sportsmen release little, concentrated urine at the end of a strenuous exercise (3 marks)
 - (b) a rabbit has a higher oxygen demand than a camel (3 marks)

12. While investigating a certain metabolic process in plants, students set up the apparatus as shown below in a classroom and monitored it for 48 hours.



- (a) Identify the metabolic process under investigation. (1 mark)
- (b) Account for the observations made in the test tube at the end of the investigation. (2 marks)
13. A female human being was found to have an extra sex chromosome in her cells.
- (a) Give the total number of chromosomes in the female individual's cells. (1 mark)
- (b) Explain the possible cause of this condition. (2 marks)
- (c) State **two** physical characteristics observed in the female individual with such a condition. (2 marks)
14. (a) Explain why fossil records as evidence of organic evolution are usually incomplete. (3 marks)
- (b) Name the evidence of organic evolution exhibited by occurrence of similar amino acid molecules in a range of organisms. (1 mark)
15. (a) Distinguish between guttation and transpiration. (1 mark)
- (b) State the significance of transpiration to a plant. (2 marks)
16. State **two** benefits of mutation in living organisms. (2 marks)

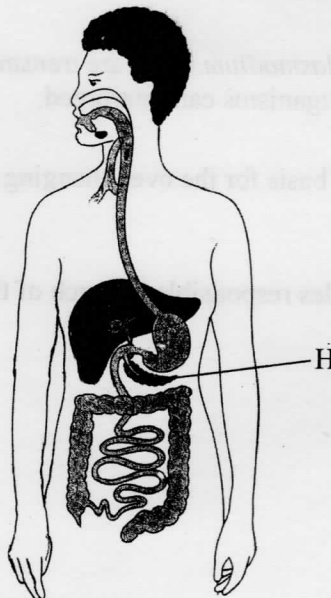
17. Below are photographs of two dogs.



Explain the possible reason for the difference in the length of their fur. (2 marks)

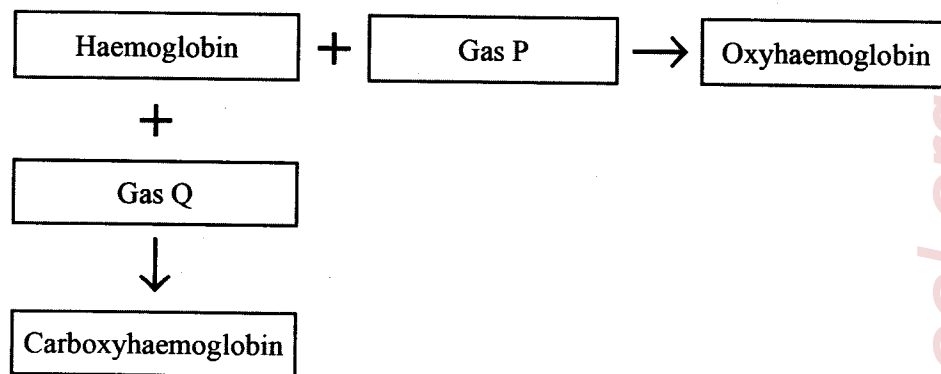
18. Name the type of tooth in carnivores mainly used for piercing and killing of preys. (1 mark)

19. Below is a diagram of the human digestive system.



- (a) Label with Y on the diagram where enzyme amylase is produced. (2 marks)
- (b) Besides the digestive role, explain **one** other function of the part labelled H. (2 marks)
20. State how each of the following features enhance efficient movement of fish in water:
- (a) Scale (1 mark)
- (b) body shape (1 mark)
21. Make a diagram of a simple, bilobed leaf with a serrated margin. (3 marks)

22. The chart below illustrates how respiratory gases are transported in the human blood.



- (a) Identify gas Q. (1 mark)
- (b) Explain the advantage oxyhaemoglobin has over carboxyhaemoglobin. (2 marks)
23. State **three** homeostatic roles of the liver. (3 marks)
24. (a) *Plasmodium vivax* and *Plasmodium ovale* are transmitted by a mosquito. State with a reason whether the two organisms can interbreed. (2 marks)
- (b) Explain the evolutionary basis for the ever changing drugs for malaria treatment. (2 marks)
25. State **one** characteristic of muscles responsible for each of the following:
- (a) peristaltic movement (1 mark)
- (b) movement of limbs (1 mark)