

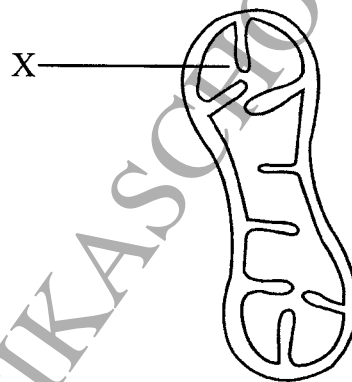
3.8 GENERAL SCIENCE (237)

3.8.1 General Science Paper 1 (237/1)

SECTION A: BIOLOGY (34 marks)

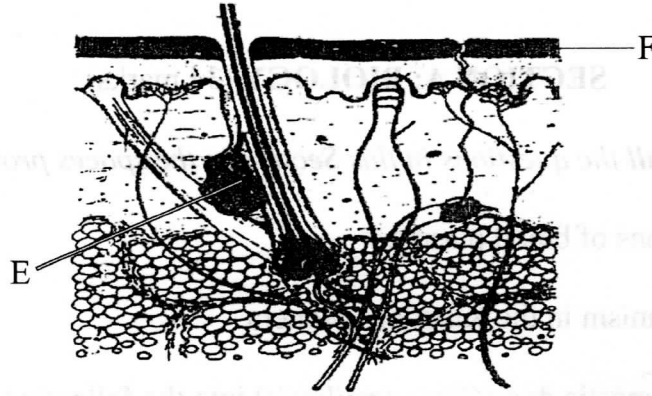
Answer **all** the questions in this Section in the spaces provided.

1. State the **three** functions of blood plasma. (3 marks)
2. (a) Name **one** organism in the Kingdom Monera. (1 mark)
(b) Classify the domestic dog (*Canis familiaris*) into the following taxonomic units:
 - (i) phylum (1 mark)
 - (ii) class (1 mark)
3. The diagram below shows a cell organelle found in an animal cell.



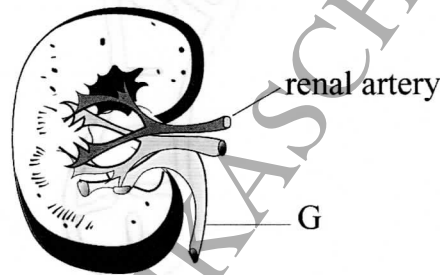
- (a) Name the organelle illustrated above (1 mark)
 - (b) Identify the part labelled X (1 mark)
 - (c) (i) State the function of the organelle illustrated. (1 mark)
(ii) How is the organelle illustrated above structurally adapted to its function? (2 marks)
4. State **three** characteristics of respiratory surfaces in animals. (3 marks)
 5. State **three** factors that increase the rate of diffusion. (3 marks)

6. The diagram below shows a section of the human skin.

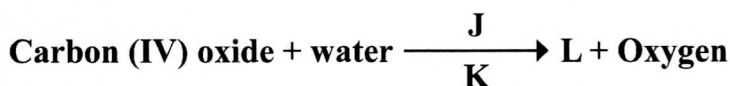


- (a) (i) Name the part labelled **E** (1 mark)
- (ii) Give **one** function of the structure labelled **E** (1 mark)
- (b) How is the part labelled **F** adapted to its function? (2 marks)

7. The diagram below represents a section of a human kidney.



- (a) (i) Name the structure labelled **G**. (1 mark)
- (ii) Give the function of the structure labelled **G**. (1 mark)
- (b) State **two** ways of treating kidney failure. (2 marks)
8. Give **three** structural factors that increase the rate of transpiration in plants. (3 marks)
9. State **one** difference between movement and locomotion. (1 mark)
10. Below is a word equation of a process in plant nutrition.



- (a) (i) Name the product labelled **L** (1 mark)

- (ii) State the requirements labelled J and K (2 marks)

J

K

- (b) Explain the importance of the product L. (2 marks)

SECTION B: CHEMISTRY (33 marks)

Answer *all* the questions in this Section in the spaces provided.

11. Dilute Sulphuric(VI) acid was added to A, which is a compound of magnesium. A reacted with the acid to form a colourless solution B and a colourless gas C which formed a white precipitate with calcium hydroxide solution.

- (a) Identify:

(i) Compound A (1 mark)

(ii) Solution B (½ mark)

(iii) Gas C (½ mark)

- (b) Write an equation for the reaction that took place between compound A and the acid. (1 mark)

12. (a) Describe how a sample of oil can be extracted from macadamia seeds in a Chemistry laboratory. (2 marks)

- (b) Figure 1 shows the steps followed during fractional distillation of liquid air.

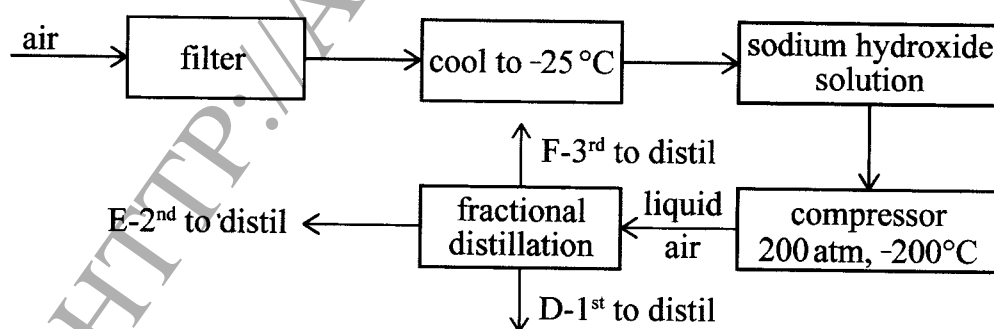


Figure 1

(i) Name the process that takes place at the filter. (1 mark)

(ii) State the role of sodium hydroxide solution in the preparation of liquid air. (1 mark)

(iii) Identify substance D. (½ mark)

(iv) State **one** use of substance E. (½ mark)

(b) Draw and label the structure of G. (2 marks)

14. Figure 2 is an illustration of one of the methods used to prepare salts.

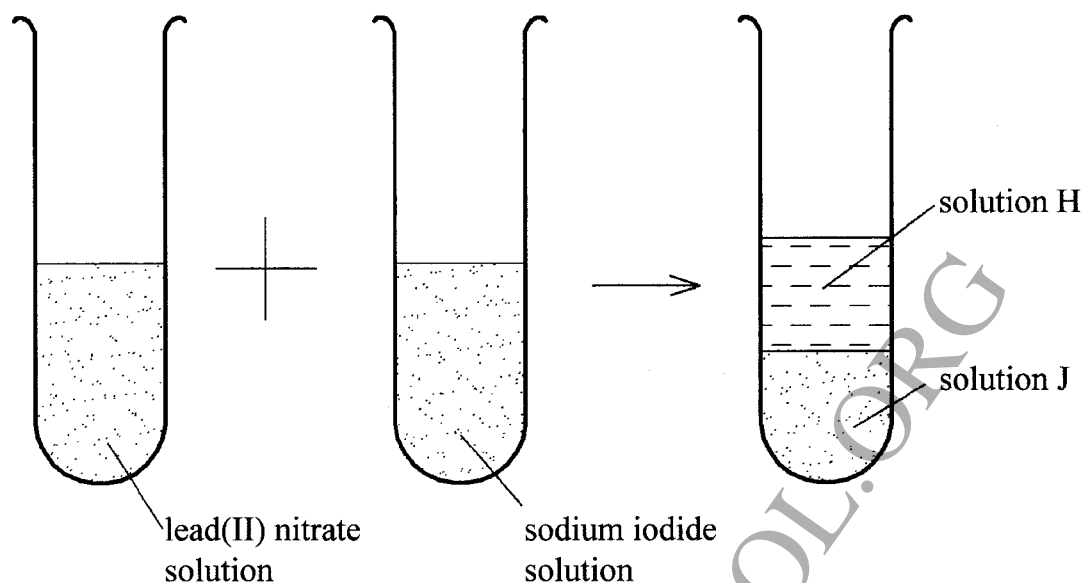


Figure 2

(a) Name solid J. (1 mark)

(b) Name the method of salt preparation demonstrated in Figure 2. (1 mark)

15. In terms of structure and bonding explain the following statements.

(a) Copper is used to make electrical cables. (1 mark)

(b) Solid sodium chloride does not conduct heat and electricity. (2 marks)

16. Use the information in Table 1 to answer the questions that follow.

Table 1

	K	L	M	N
KO	no reaction	no reaction	no reaction	no reaction
NO	KO + N	LO + N	MO + N	no reaction
LO	KO + L	no reaction	MO + L	no reaction
MO	KO + M	no reaction	no reaction	no reaction

(a) Arrange the elements in order to reactivity starting with the most reactive. (2 marks)

(b) What property of the elements is displayed in Table 1? (1 mark)

17. Explain the following statements:

- (a) Group VIII elements are said to be inert. (1 mark)
- (b) Magnesium and silicon are solids at room temperature, yet silicon has a higher melting point than magnesium. (3 marks)

18. Figure 3 shows a set up that is used to investigate the effect of an electric current on various substances.

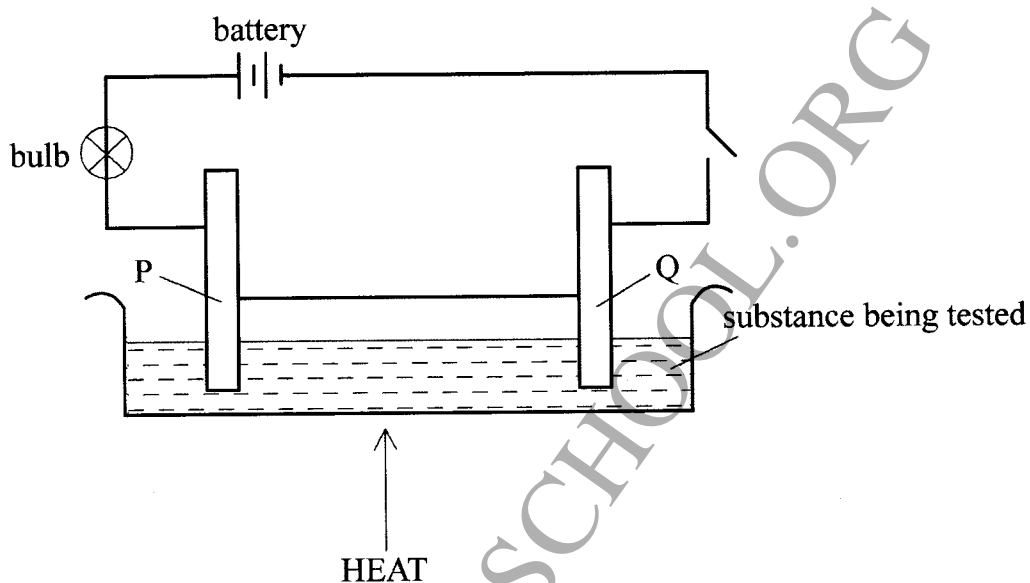


Figure 3

- (a) Identify the electrodes labelled
- (i) P (½ mark)
- (ii) Q (½ mark)
- (b) What observations will be made if lead(II) bromide was the substance under investigation. (1 mark)

19. Explain how water hardness can be removed using the ion-exchange method. (2 marks)

20. The set up in **Figure 4** was used to investigate the reaction of calcium with cold water.

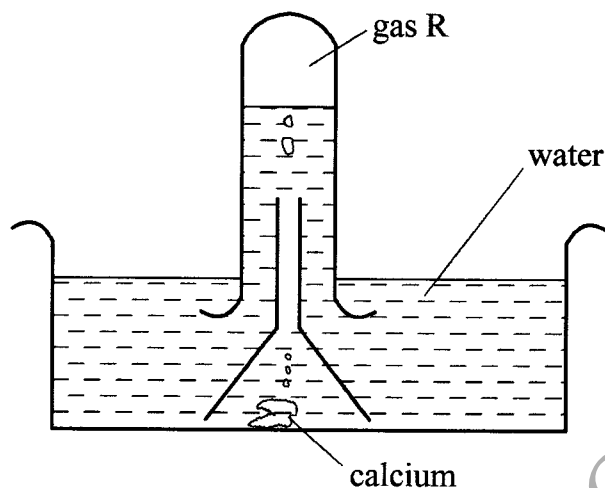


Figure 4

- (a) Name gas **R**. (½ mark)
- (b) Explain the observation that was made when a few drops of phenolphthalein indicator were added to the resulting solution. (1 mark)
- (c) If magnesium ribbon was used in place of calcium, explain why it was necessary to clean the magnesium with steel wool before its reaction with water. (1½ mark)

21. Study **Figure 5** and answer the questions that follow.

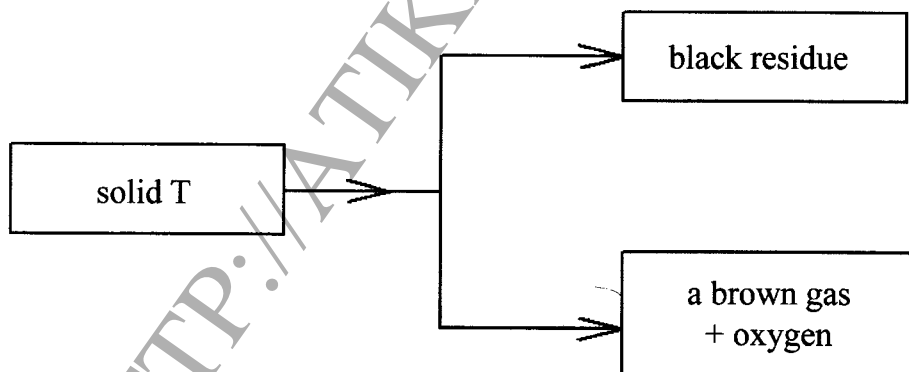


Figure 5

- (a) Name solid **T**. (1 mark)
- (b) Identify the brown gas. (1 mark)

SECTION C: PHYSICS (33 marks)

Answer **all** the questions in this Section in the spaces provided.

22. State **one** reason why students should not carry or eat food in the laboratory. (1 mark)

23. **Figure 6** shows a metre rule being used to measure the length of a block of wood.

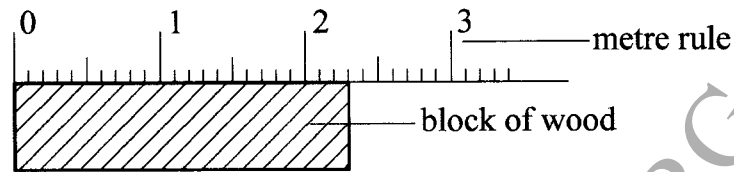


Figure 6

Record the length of the block of wood. (1 mark)

24. Complete the **Table 2** below. (2 marks)

Table 2

Physical Quantity	SI Unit	Symbol of Unit
Mass		
	Newton	

25. Define the term *Power*. (1 mark)

26. Two students A and B are taking milk using a straw. A is standing on top of a high mountain while B stands at the foot of the mountain. State with a reason which student takes the milk more easily. (2 marks)

27. Explain why a gas occupies the whole space of the container in which it is placed. (2 marks)

28. (a) A student observed that gaps between rails along a railway line were larger in the morning than in the afternoon. Explain the observation. (2 marks)

(b) State the purpose of the constriction in a clinical thermometer (1 mark)

29. **Figure 7** shows an immersion heater being used to heat water in a jug and a thermometer placed in the water with its bulb below the heating coil.

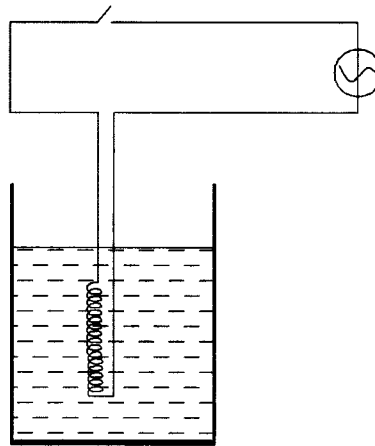


Figure 7

It was observed that when the water started to boil the thermometer reading was lower than the boiling point of water. Explain this observation (2 marks)

30. A uniform plank of wood of length 5 m is pivoted at its centre. A girl of mass 32 kg sits at one end of the plank. Determine how far from the pivot a boy of mass 40 kg should sit in order to balance the plank. (3 marks)
31. (a) A ball rests on a level floor. Name its state of equilibrium. (1 mark)
- (b) State how the area of the supporting base affects the stability of the object. (1 mark)
32. (a) Define “elastic limit” (1 mark)
- (b) A spring supporting a weight of 30 N extends by 1.5 cm. Determine the spring constant. (3 marks)



33. Figure 8 shows the velocity time graph for a vehicle.

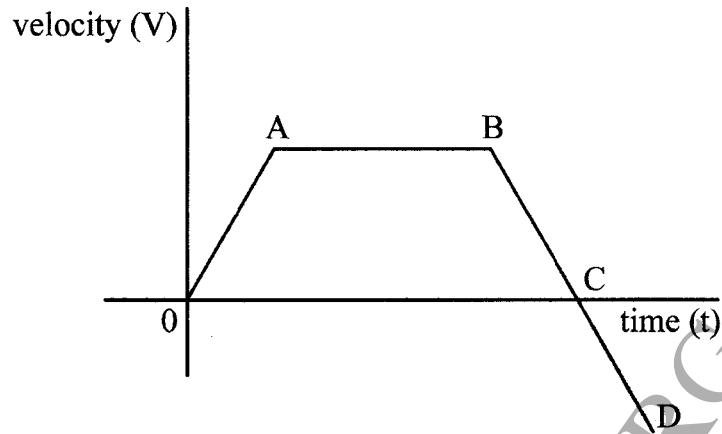


Figure 8

Describe the motion of the vehicle in the regions. (3 marks)

AB

BC

CD

34. (a) Define *inertia*. (1 mark)

(b) Explain how striking a matchstick on a matchbox causes fire. (2 marks)

35. (a) State the law of flotation. (1 mark)

(b) Explain why an object weighs more in air than when fully immersed in water. (3 marks)

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