

INSTRUCTIONS

- (a) Answer any six questions from this paper.
(b) All questions carry equal marks.

SECTION A - PHYSICS

1. (a) What is meant by the weight of a body ?
(b) What apparatus would you use and what would you do to show that a floating body displaces its own weight of the liquid in which it floats ?
(c) Draw a labelled diagram of a hydrometer.
(d) An ice cube floats in water with one tenth of its volume above the surface. Calculate the density of the ice.

2. (a) What is meant by the temperature of a body ?

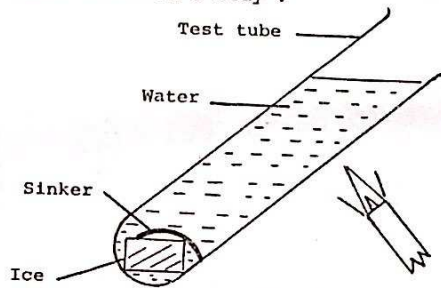


FIG. 1

- (b) Fig. 1 illustrates an experiment to examine water as a conductor of heat.
(i) What happens as the water is heated ?
(ii) What conclusions can you draw from this experiment ?

- (c) Fig. 2 illustrates an experiment to study heat radiation. Hot water is poured into a cubic vessel; one side of the vessel is painted white and the opposite side black. Two thermometers are placed equidistant from the box as shown in the diagram.

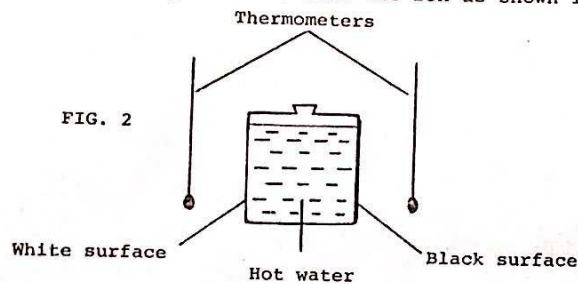


FIG. 2

- (i) Which thermometer shows the faster rise in temperature ?
(ii) What does the experiment prove ?
(d) Ships which visit warm climates are usually painted in bright colours. Why is this ?
3. (a) Name three forms of energy.
(b) Fig. 3 represents an experimental circuit.

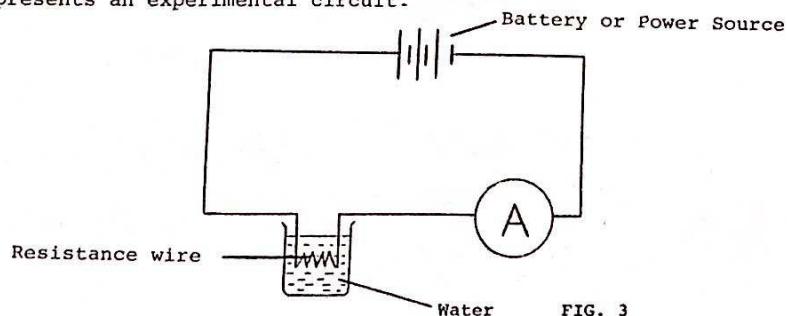


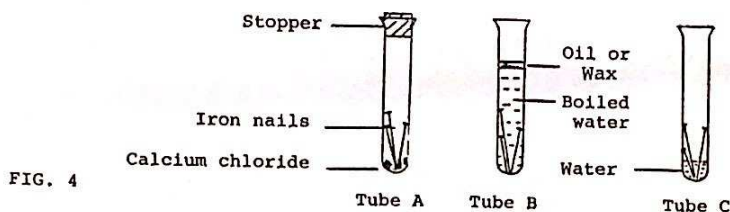
FIG. 3

- (i) Name the instrument A and state its purpose.
(ii) What happens to the water as the current flows ?
(c) How would you show that there are magnetic lines of force in the centre of a coil through which an electric current flows ?
(d) Describe one use of such a coil.

4. Answer any eight of the following items. Keep your answers short.
- State one way in which a force can affect a body.
 - A medicine dropper is held in an upright position but the medicine does not come out until someone squeezes the bulb. Why is this?
 - Why does steam at 100°C give a worse scald than water at the same temperature?
 - Why are gaps left between lengths of railway track?
 - How does a gas in a closed container exert a pressure?
 - What are ions?
 - How long would it take a 100-watt bulb to use one unit of electricity?
 - Why does a magnetic compass indicate direction?
 - What is meant by the fixed points of a thermometer?
 - What is meant by convection of heat?
 - State any one use of an electroscope.
 - How would you magnetise an iron nail?

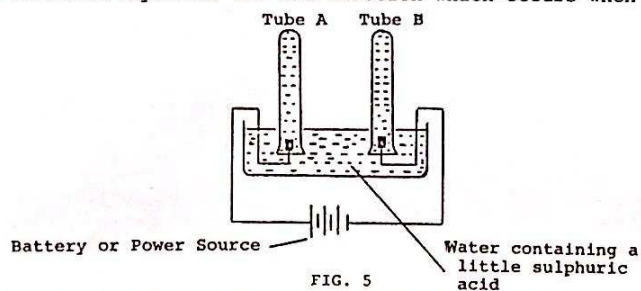
SECTION B - CHEMISTRY

5. (a) What is a mixture?
- (b) How would you obtain a sample of pure water and of pure paraffin oil from a mixture of both?
- (c) A small quantity of lime-water was placed in a watch-glass and some anhydrous copper sulphate was placed in another. The watch-glasses were exposed to the air for one week.
- Describe the changes you would expect to occur in each case.
 - What conclusions concerning the composition of the air can be drawn from this experiment?
- (d) How would you prove that air contains oxygen?
6. (a) What is a compound? Give two examples.



- (b) Fig. 4 illustrates an experiment to determine the conditions needed for rusting.
- What is the purpose of the calcium chloride in tube A?
 - Why has the water in tube B been boiled before the experiment? What is the purpose of the oil or wax?
 - In which tube will rusting occur? What conclusions can you draw from this experiment?
- (c) Name one method of rust prevention.

7. (a) What is a chemical change?
- (b) Write a balanced equation for the reaction which occurs when hydrogen gas burns in air.



- (c) Fig. 5 illustrates the decomposition of water by electrolysis.
- Name the gases which collect in tube A and tube B.
 - Which tube will contain the greater volume of gas?
 - How would you identify each gas?

8. Answer any eight of the following. Keep your answers short.

- What is an indicator?
- Name the substances you would use to prepare carbon dioxide.
- Name one substance which sublimes.
- What information is contained in the formula for ammonia (NH_3)?
- Name the allotropes of carbon or sulphur.
- How do protons and neutrons differ from each other?
- How are the nine electrons of the element fluorine arranged around the nucleus?
- What is distillation?
- What use is made of paper chromatography?
- Complete the equation: $\text{HCl} + \text{NaOH} = \dots + \dots$
- Which of the following compounds are ionic?
 - Sodium chloride,
 - carbon dioxide,
 - paraffin wax,
 - sodium hydroxide.
- How is yellow phosphorus stored in the laboratory? Give a reason for your answer.

SECTION C - BIOLOGY

9. (a) Give an example of a food chain.
 (b) Name and briefly describe the habitat in which you noticed a food chain.
 (c) Name two animals and two plants you found there and state how each of them is adapted to the habitat.
 (d) How did you find out the type of food preferred by the animals of the habitat ?
10. (a) Name three functions of the stem of a green plant.

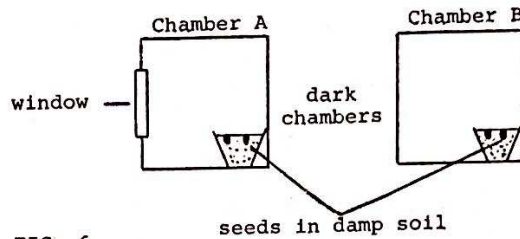


FIG. 6

- (b) Fig. 6 illustrates an experiment on tropisms.
- (i) Describe, or show by means of a sketch, the direction of growth of the seedlings in each of the chambers A and B.
 (ii) Why do the stems of the plants in each chamber grow in the direction you have stated or shown ?
 (iii) The plants in chamber B soon die. Give a reason for this.
- (c) Describe two methods by which plants are propagated vegetatively.
11. (a) What use does the body make of the air it breathes ?

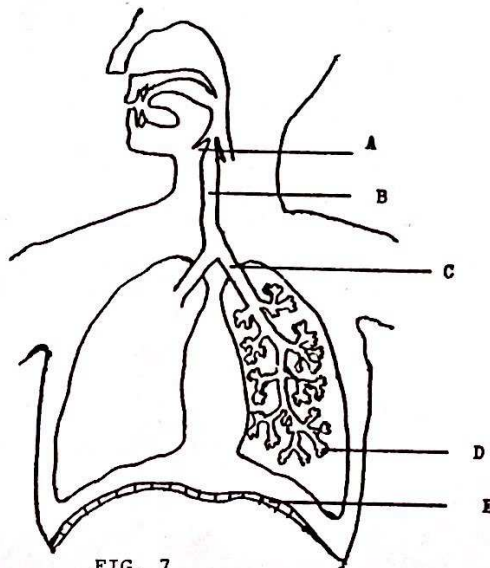


FIG. 7

- (b) Fig. 7 represents the human respiratory system. Name the parts A, B, C, D and E from the following list:-
 stomach, trachea (wind-pipe), diaphragm, bronchus, alveolus (air-sac), rib-cage, epiglottis, liver.
- (c) The lungs have excretory functions. Name two substances which they excrete.
 (d) Why do athletes breathe faster after running in a race ?
12. Answer any eight of the following. Keep your answers short.
- (a) How does blood protect the body from disease ?
 (b) What are vitamins ?
 (c) What is meant by photosynthesis ?
 (d) Name two natural methods by which seeds are scattered.
 (e) What is transpiration ?
 (f) What part does the mouth play in the process of digestion ?
 (g) Name two methods of food preservation.
 (h) Name one annual plant.
 (i) How does the root of a green plant collect minerals in the soil ?
 (j) What part do coloured petals play in the life of a green plant ?
 (k) State two ways in which micro-organisms (fungi, bacteria) are of benefit to mankind.