

AN ROINN OIDEACHAIS
BRAINSE AN IARBHUNOIDEACHAIS
DAY VOCATIONAL CERTIFICATE EXAMINATIONS, 1975
SCIENCE (SYLLABUS A)
MONDAY, 9 JUNE, 2- 4.30 p.m.

INSTRUCTIONS

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

SECTION A — PHYSICS

1. (a) Which would weigh more, 1 cm³ of mercury or 1 cm³ of water?

- (b) Fig. 1 shows an inverted drinking glass full of water, with a card covering the open end.

FIG. 1



Why does the card remain in position?

- (c) A glass tube, 1 metre long is filled with mercury and inverted into a dish of mercury as shown in Fig. 2.

- (i) What is this apparatus called?
 (ii) What is space 'A' called?
 (iii) What measurement would you make to find the pressure of the atmosphere?
 (iv) Why is mercury used?

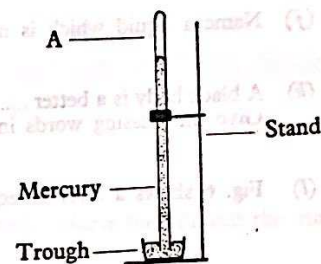


FIG. 2

2. (a) Why are gaps left between lengths of railway track?

- (b) Figs. 3A and 3B illustrate experiments to study the effect of heat on liquids and gases.

- (i) What happens as each flask is heated?
 (ii) What do the experiments prove?
 (iii) If they were heated by hand, would you notice the same effects? Give a reason for your answer.

- (c) Name two pieces of equipment or apparatus which depend on the expansion of heated substances.

- (d) A lighting match can be held comfortably in the hand whereas it is uncomfortable to hold a bar of iron which is red hot at the other end. Why is this?

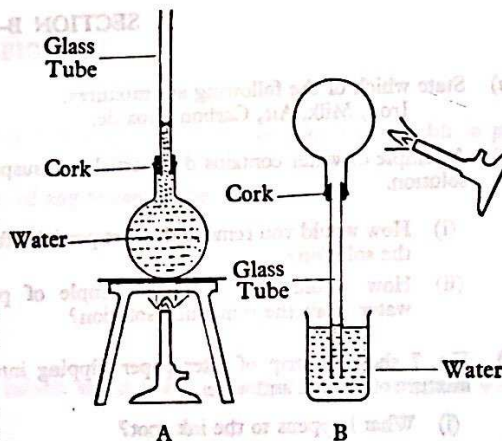


FIG. 3

3. (a) What will happen if a bar magnet is suspended horizontally by a piece of thread?

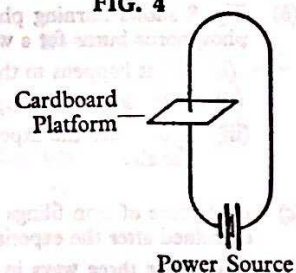
- (b) (i) What apparatus would you use and what would you do to locate the lines of force around a bar magnet?
 (ii) Make a sketch to illustrate these lines.

- (c) Some iron filings are shaken on to the cardboard platform in Fig. 4. The platform is then tapped.

- (i) What happens to the filings?
 (ii) What conclusions can you draw from this experiment?

- (d) Describe two uses for a magnet.

FIG. 4



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

- Name one heat insulator and state its use.
- What happens when two positively charged rods are brought close together?
- What is meant by the radiation of heat?
- Will the bulb in Fig. 5 light? Give a reason for your answer.
- How do electrons and protons differ from each other?
- Give two examples of a lever.
- What energy change takes place in a microphone?
- 30 cm^3 of a metal weighs 5 grams. Calculate its density.
- Give one use for a hydrometer.
- Name a liquid which is more viscous than water.
- A black body is a better.....of heat than a.....body. Give the missing words in your answer book.
- Fig. 6 shows a lever in equilibrium. Calculate the value of X.

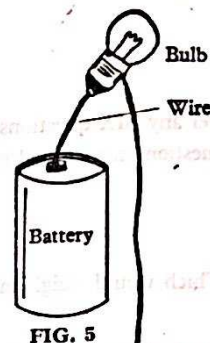


FIG. 5

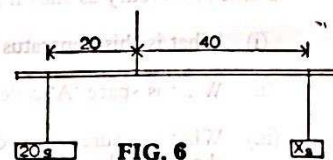


FIG. 6

SECTION B—CHEMISTRY

- State which of the following are mixtures.
Iron, Milk, Air, Carbon Dioxide.
 - A sample of water contains dirt particles in suspension and salt in solution.
 - How would you remove the dirt particles from the solution?
 - How would you obtain a sample of pure water from the remaining solution?
 - Fig. 7 shows a strip of filter paper dipping into a mixture of alcohol and water.
 - What happens to the ink spot?
 - State one use for this process.

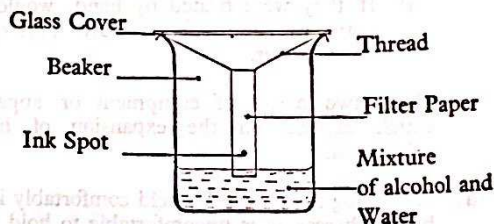


FIG. 7

- What is a chemical change?
 - Fig. 8 shows burning phosphorus in a bell-jar over water. The phosphorus burns for a while.
 - What happens to the water as the phosphorus burns?
 - Why does the phosphorus stop burning?
 - What does the experiment prove about the composition of the air?

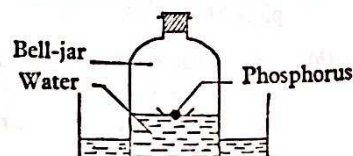


FIG. 8

- A mixture of iron filings and powdered sulphur is heated in a test tube and the contents of the test tube examined after the experiment.
 - State three ways in which the resulting material differs from the original mixture.
 - What is the new substance called?

7. (a) Name two elements which can exist as allotropes.
 (b) Powdered sulphur is melted in a test tube and poured into a beaker of cold water.
 (i) How do the properties of the resulting solid differ from those of sulphur powder?
 (ii) What is the new solid called?
 (c) (i) Name the substances you would need to prepare carbon dioxide.
 (ii) How would you collect the gas?
 (iii) When blue litmus paper is dipped into water containing carbon dioxide, the litmus turns red. What does this prove?
 (d) State two uses for carbon dioxide.
8. Answer any **eight** of the following. Keep your answers short.
 (a) Air contains approximately 78% by volume, of gas X. Name X.
 (b) Name two covalent compounds.
 (c) Name two conditions necessary for the rusting of iron.
 (d) How would you separate a mixture of iron filings and sawdust?
 (e) What is an inert gas?
 (f) How are the ten electrons in an atom of Neon arranged around the nucleus?
 (g) What information is contained in the formula H_2O ?
 (h) Complete the chemical equation $Zn + H_2SO_4 \longrightarrow$
 (i) Write this equation in words: $NH_3 + HCl \longrightarrow NH_4Cl$
 (j) Name the states of matter represented by diagrams A, B and C in Fig. 9.

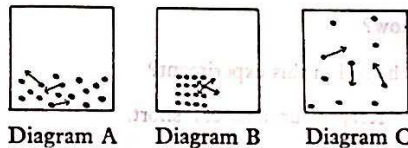


FIG. 9

- (k) When sodium hydroxide and hydrochloric acid are mixed a salt is formed. Name the salt and the other product of the reaction.
 (l) Sodium metal is stored under oil in the laboratory. Give a reason for this.

SECTION C—BIOLOGY

9. (a) What is a habitat?
 (b) Name a habitat you studied and describe briefly what it was like. (A sketch or map is acceptable in place of a written description).
 (c) Give an example, which you noticed in the habitat, of any **three** of the following:—
 (i) Competition between plants.
 (ii) Competition between animals.
 (iii) Adaptation of plants to the habitat.
 (iv) Adaptation of animals to the habitat.
 (d) Describe any changes you noticed in the life of the habitat as the seasons changed from Summer to Winter or from Winter to Summer.
10. (a) Why do living things need food?
 (b) Fig. 10 is a simplified drawing of the human digestive system.
 (i) Name parts A, B, C, D, E.
 (ii) Name **one** part of the system in which food is taken into the bloodstream.
 (c) What is the function of the caecum in the rabbit?
 (d) What happens when iodine solution is dropped on a slice of raw potato? What does the experiment prove?

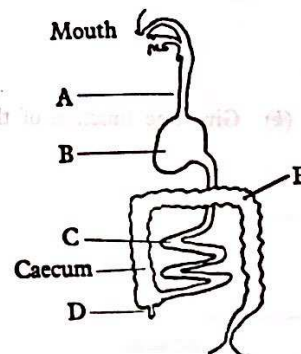


FIG. 10

OVER→

11. (a) The root of the green plant collects water and.....from the..... Rewrite this statement in your answerbook filling in the blanks.

(b) Fig. 11 shows an experiment to study one of the functions of the root of a green plant.

- (i) What is the purpose of the oil?
- (ii) What happens to the level of the oil over a period of twenty-four hours?
- (iii) What conclusions can be drawn from the experiment?

(c) Fig. 12 shows another experiment on plant biology.

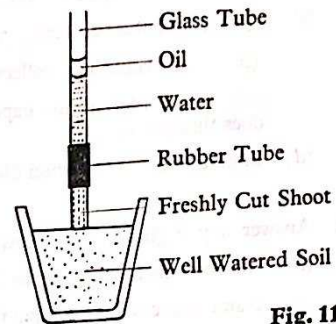
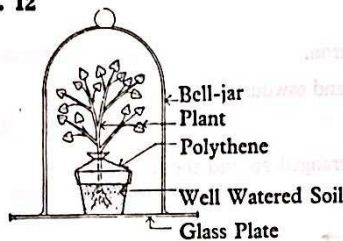


Fig. 11

FIG. 12



- (i) What happens when the experiment is left as shown for a few hours?
- (ii) What does the experiment show?
- (iii) Why is it necessary to cover the soil in this experiment?

12. Answer any **eight** of the following. Keep your answers short.

- (a) Name two ways in which seeds are scattered.
- (b) What part does the honey bee play in the life cycle of the flowering plant?
- (c) What is meant by saying that a tree is a perennial plant?
- (d) Why must blood circulate around the body of a mammal?
- (e) In the case of **two** of the following animals state how it obtains oxygen from its surroundings:—
worm, whale, mature frog, fish.
- (f) Many plants produce food stores in the stem or root to carry them through the winter. Why are these stores normally formed under the ground?
- (g) Name two substances exhaled from the lungs?
- (h) Some fresh foods go bad on exposure to air over a short period of time. Why does this happen? Name **one** method which would preserve food.
- (i) Name three stages in the life cycle of a frog.

(j) Fig. 13 shows a cylinder of water in which a sample of soil has been shaken and left to stand. Name the layers A and B.

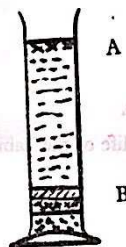


FIG. 13

(k) Give **one** function of the green leaf of a plant.