

AN ROINN OIDEACHAIS
INTERMEDIATE CERTIFICATE EXAMINATION, 1990
SCIENCE — SYLLABUS E

TUESDAY, 12 JUNE — MORNING, 9.30 to 12.00

Answer question 1 and 5 other questions.
 All questions carry equal marks.

1. Answer *ten* of the following.
- (a) Fig. 1 shows the centre of gravity of a regular piece of wood.
 What is meant by *centre of gravity*?
 - (b) Name any *one* of the three small bones in the middle ear.
 - (c) Name *three* stages in the life cycle of the frog.
 - (d) Soil and water are shaken in a measuring cylinder and then allowed to settle as shown in Fig. 2.
 What substances are found at **A** and **B**?
 - (e) A 40 gram mass extends a spiral spring by 8 cm.
 What mass will extend the spring by 10 cm?
 - (f) What process is being examined in the experiment shown in Fig. 3?
 - (g) Name *two* substances excreted by the lungs.
 - (h) What test would you use to show that a colourless liquid is water?
 - (i) If liquid **A**, in Fig. 4, which has a density of 0.8 g cm^{-3} rises by 10 cm what will be the height of the water column?

FIG 1



FIG 2

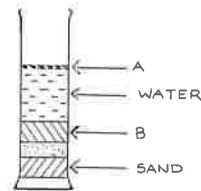


FIG 3

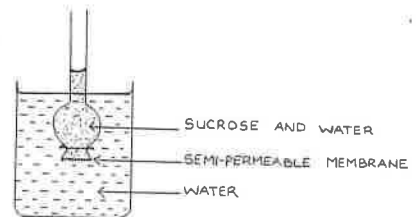
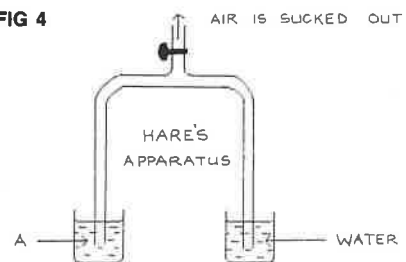


FIG 4

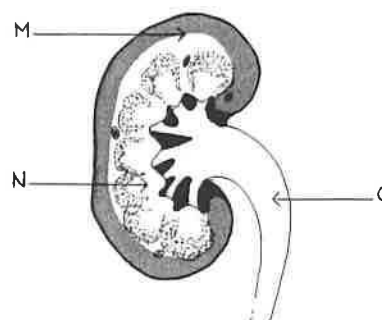


- (j) What is the response of a root to gravity called?
- (k) Name *one* common parasite.
- (l) Name *two* methods of food preservation.
- (m) What is a *perennial* plant?
- (n) Explain why a balloon which has been rubbed will stick to a wall.
- (o) Why is it considered advisable to remove lead from petrol?

2. (a) (i) What effect, if any, would sulphuric acid have on moist blue litmus?
 (ii) What is the chemical formula for sulphuric acid?
- (b) (i) Using diagrams, show the arrangements of electrons in sodium and chlorine and what happens when the two elements react together.
 (ii) *Briefly* describe how you would make sodium chloride in the laboratory.
- (c) (i) What is the gas given off by hydrogen peroxide when left standing in sunlight?
 (ii) Explain why the addition of chopped fresh liver speeds up the release of this gas.

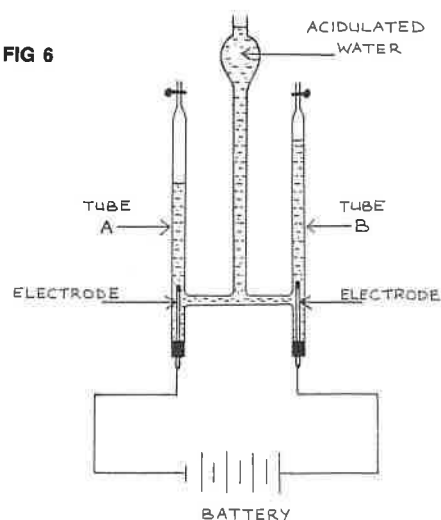
3. (a) How do we know that bone is a living tissue?
- (b) (i) Draw a labelled diagram of the human heart.
 (ii) On this diagram, show by means of arrows, the directions of the blood flow.
- (c) (i) Give the names of the parts labelled M, N, O in the diagram of the kidney shown in Fig. 5.
 (ii) In the case of each of the hormones insulin and adrenalin state
 (a) where it is produced,
 (b) its function.

FIG 5



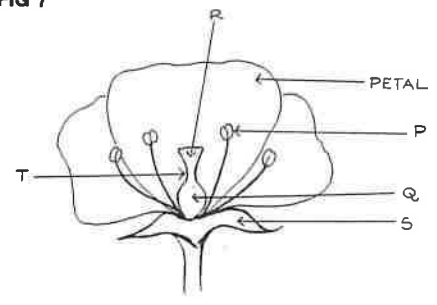
4. (a) (i) Give *one* advantage and *one* disadvantage of hard water.
 (ii) How would you remove *temporary* hardness from water?
- (b) Fig. 6 shows an electric current being passed through acidulated water.
 (i) What is the purpose of this experiment?
 (ii) What gas collects in tube A?
 (iii) Why is the acid added to the water?
 (iv) In which tube is the negative electrode found?
- (c) (i) Describe an experiment to show transpiration.
 (ii) Draw a labelled diagram of the apparatus you would use.

FIG 6



5. (a) Name the parts of the flower labelled P, Q, R, S and T in Fig. 7.
- (b) Describe, using a labelled diagram, an experiment to show the conditions necessary for germination of seeds.
- (c) An increased amount of carbon dioxide in the atmosphere is leading to what is called "The Greenhouse Effect".
- (i) What is the Greenhouse Effect?
 - (ii) Why is the amount of carbon dioxide in the atmosphere increasing?
 - (iii) What are the possible consequences of the Greenhouse Effect?
 - (iv) What measures should be taken to reduce the level of CO₂ in the air?

FIG 7



6. (a) (i) What is a compound?
- (ii) Select *two* examples of compounds from the following list:
air, glucose, carbon dioxide, potassium, water, hydrogen.
- (b) (i) Describe how you would prepare and collect carbon dioxide gas in the laboratory.
- (ii) Draw a labelled diagram of the apparatus you would use.
- (c) (i) Explain what is meant by the *fixation of nitrogen*.
- (ii) How do insectivorous plants obtain the nitrogen necessary for growth?

7. (a) What is a (i) Herbivore, (ii) Carnivore?
Give an example in each case.
- (b) Give the function of any *two* of the following pieces of equipment and in the case of any *one*, describe how you would use it in the study of a habitat.
- (i) Tullgren Funnel
 - (ii) Pitfall Trap
 - (iii) Pooter
- (c) Thrushes, aphids and ladybirds are found in a rose garden.
- (i) Construct a food chain containing these organisms and add one other possible link to this chain.
 - (ii) If a rose spray is used to kill the aphids, how will the food chain be affected?

8. (a) Study the table on digestion in Fig. 8.

What do the letters X, Y, Z represent?

- (b) Describe an experiment to show the affect of saliva on starch.
- (c) (i) Why is digestion of food necessary?
(ii) Explain, briefly, what happens to the food when digestion is complete?

FIG 8

Food Type	Digested To
Starch	X
Protein	Y
Fat	Z

- 9. (a) (i) Name *two* ways in which an iron nail may be magnetised.
(ii) Name *one* way in which magnetism may be destroyed.
- (b) (i) Describe how you would show the magnetic field around a bar magnet, using iron filings.
(ii) Draw a diagram of the result.
- (c) Draw a simple electrical circuit diagram, in each case, to show a battery with three bulbs
(i) in series and (ii) in parallel.
Why would the bulbs in parallel be brighter?

- 10. (a) (i) Name *one* conductor and *one* insulator of electricity.
(ii) What is the function of the earth in an electrical appliance?
- (b) Describe, using a labelled diagram, how you would show the dispersion of white light.
- (c) (i) What is an echo?
(ii) Fig. 9 shows a small boat using sonar equipment to find the depth of water in the sea.

The sound wave takes 4 seconds to travel from the ship to the sea bed and back again.

How deep is the water?

[The speed of sound in water is 700 m/sec.]

FIG 9

