

## INTERMEDIATE CERTIFICATE EXAMINATION, 1984

## SCIENCE—SYLLABUS E

THURSDAY, 14 JUNE—MORNING, 9.30 to 12.00

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

1. Answer *ten* of the following items. (Keep your answers short).

- (a) In the animal kingdom, what name is given to the group of animals without backbones?
- (b) 100 cm<sup>3</sup> of water are added to the contents of each funnel in the diagram Fig. 1. In which cylinder will the greater volume of water collect?
- (c) A stone with a mass of 50 g displaces 25 cm<sup>3</sup> of water. Calculate the density of the stone.

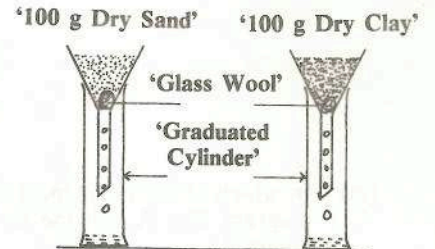


Fig. 1

- (d) What method is being used in the diagram Fig. 2 to separate the two substances?

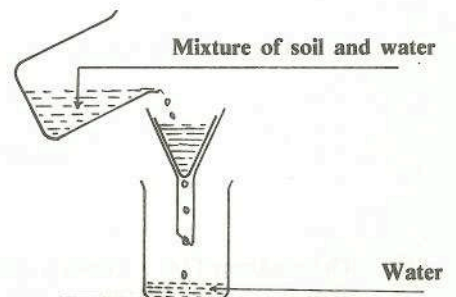


Fig. 2

- (e) The diagram Fig. 3 shows a section through a leaf. Name the parts A and B.
- (f) What name is given to the nerve which carries impulses from the retina to the brain?
- (g) A sample of soil is found to have a pH of 8.5. What does this indicate?

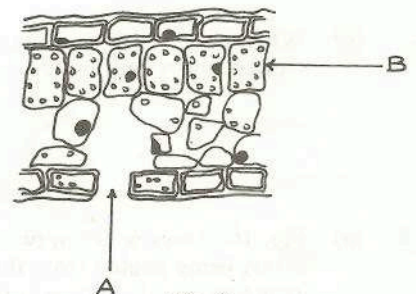


Fig. 3

- (h) In the diagram Fig. 4, what will happen when air is withdrawn from the bell-jar?

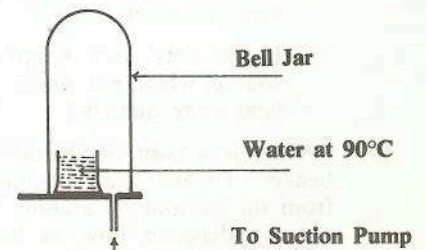


Fig. 4

- (i) What are the three states of matter?
- (j) What change will take place in the concentration of the sugar solution if the experiment in Fig. 5 is left for twenty four hours?

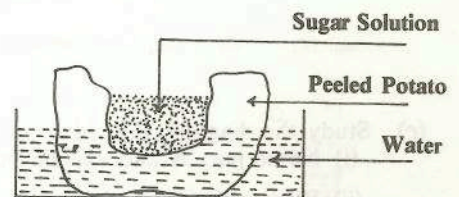


Fig. 5

- (k) Suggest a reason for the root development shown in the diagram Fig. 6.

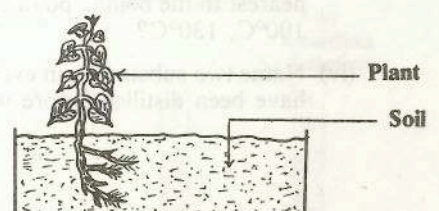


Fig. 6

- (l) What is the name of the piece of apparatus shown in the diagram Fig. 7?



Fig. 7

- (m) In which of the tubes marked A, B and C in the diagram Fig. 8, will the level of the water rise highest?

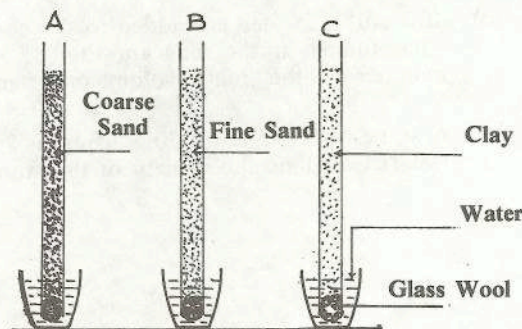


Fig. 8

- (n) The diagram Fig. 9 shows a strip of filter paper dipping into a mixture of alcohol and water. What is this process called?

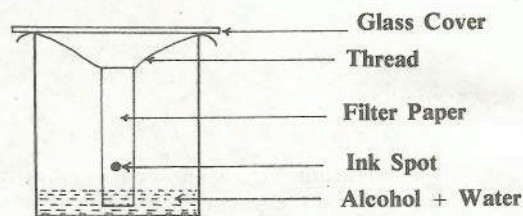


Fig. 9

- (o) What colour will a white object appear when viewed under red light?

2. (a) Fig. 10 shows water in two pots, one black, one silver, being heated from the same source. Each contains exactly 200 cm<sup>3</sup> of water.

- (i) In which pot would you first expect the water to reach 80°C?  
 (ii) If the pots were removed from the heat source, which pot would you expect to lose heat more quickly?

- (b) "Water is a poor conductor of heat, though a beaker of water heats up quickly when heated from the bottom." Carefully describe, with the aid of a diagram, how the heat travels through the water.

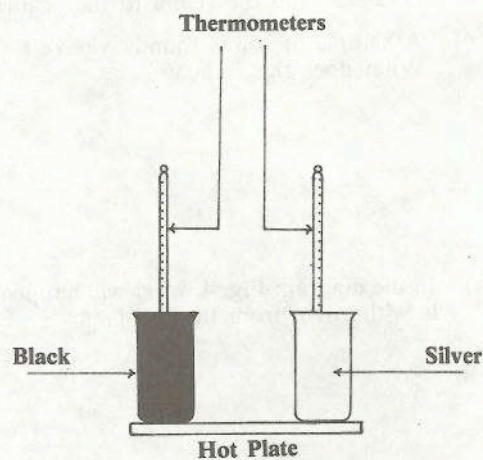


Fig. 10

- (c) Study the diagram Fig. 11.

- (i) Name part A and explain how it works.  
 (ii) What substance would you expect to find first in the beaker?  
 (iii) Which of the following temperatures is nearest to the boiling point of alcohol: 78°C, 100°C, 130°C?  
 (iv) Name two substances in everyday use which have been distilled before we use them.

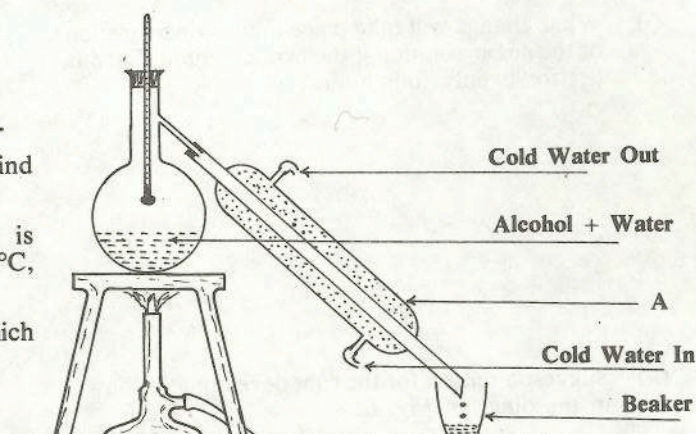


Fig. 11

3. (a) Name two allotropes of carbon.
- (b) The diagram Fig. 12 shows the apparatus which could be used to prepare hydrogen gas.
- Name the substances which might be used in the flask to produce hydrogen.
  - What test would you carry out to confirm that hydrogen was produced?
  - Which *two* of the following substances contain hydrogen: copper sulphate, sulphuric acid, sodium hydroxide, sodium chloride?
  - Why would it be difficult to collect ammonia over water as shown in the diagram Fig. 12?

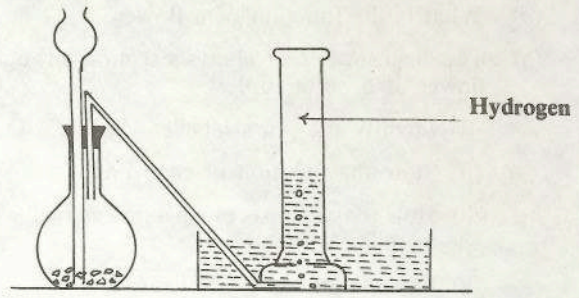


Fig. 12

- (c) The Diagram Fig. 13 shows the burning of magnesium ribbon.
- Why is the crucible left partly uncovered?
  - Why do the contents of the crucible change weight after burning?
  - Name the white substance formed.
  - How would you show that the substance formed was alkaline?

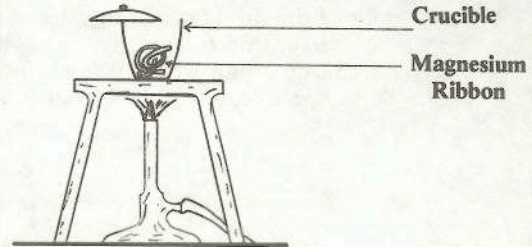


Fig. 13

4. (a) Give two examples of the everyday use of magnets.
- (b) Explain with the aid of a diagram how an old hacksaw blade might be magnetised using a bar magnet.
- (c) Explain with the aid of a labelled diagram how an electric bell works.
5. (a) Name *two* fruits dispersed by wind and *two* fruits dispersed by animals.
- (b) In relation to any habitat which you have studied:
- Describe the habitat — use a diagram if you wish.
  - List some plants and animals that you found there.
  - Describe the influence of light on life in this habitat.
  - Construct a relevant food chain that you observed there.
- (c) (i) Name *two* types of asexual reproduction in plants.
- (ii) Carefully describe any *one* of the types you mention.

6. (a) Name *two* places in the human body where cartilage is found.
- (b) (i) What type of joint is shown in the diagram, Fig. 14?
- (ii) What type of movement does this type of joint allow?
- (iii) Name *two* places in the body where this type of joint may be found.
- (iv) Name one other type of joint found in the human body.

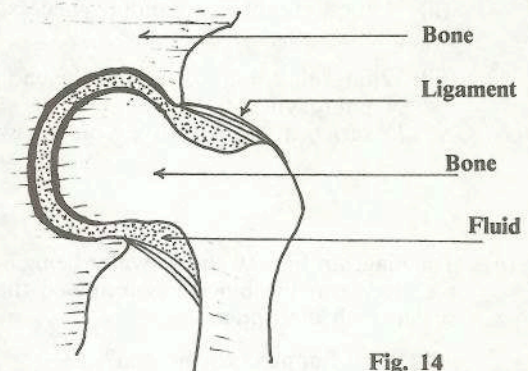


Fig. 14

- (c) A bone is immersed in dilute hydrochloric acid for one week when it is observed that bubbles of gas are given off and the bone has become flexible.
- What is the name of the gas given off?
  - Give a laboratory test for the gas you name.
  - Why did the bone become flexible?
  - Name *one* chemical element necessary for good bone development.

7. (a) What is meant by digestion?
- (b) Draw a labelled diagram to show the main parts of the digestive system in man. Briefly describe the function of each part.
- (c) The diagram Fig. 15 shows an experiment set up to investigate the action of an enzyme. Give the result and a reason for your answer in each case.

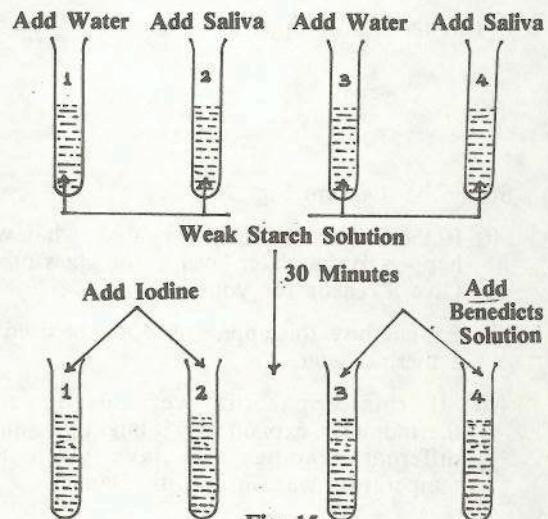


Fig. 15

8. (a) What is the function of a flower?
- (b) The diagram Fig. 16 shows a section through the flower of a buttercup.
- Identify the parts labelled A, B, C, D, E.
  - State the function of each part.
  - How may an insect help a flower such as this to fulfil its function?
  - Explain the term 'fertilization'.
- (c) In an experiment, the stamens are removed from the flowers of pure dwarf pea plants. Pollen from the flowers of pure tall pea plants is brushed on the stigmas of the dwarf pea plants. Each flower is then covered with a fine muslin bag. The ripe seeds are collected and sown. Will the new pea plants be tall or dwarf? Explain your answer.

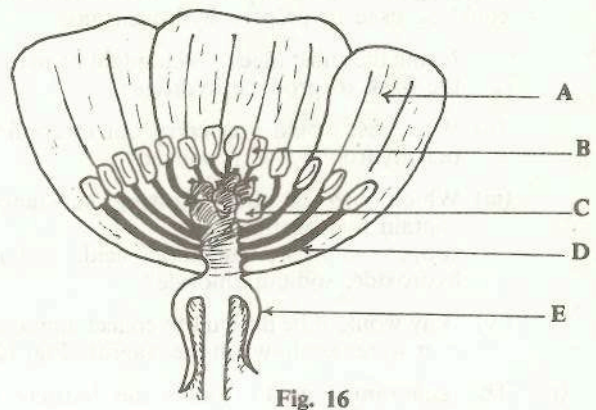


Fig. 16

9. (a) Fig. 17 shows an experiment set up to study one of the functions of the root of a green plant. What happens to the level of the oil over a period of twenty four hours? Give a reason for your answer.
- (b) How would you show that the leaf of a healthy, well watered plant gives off water?

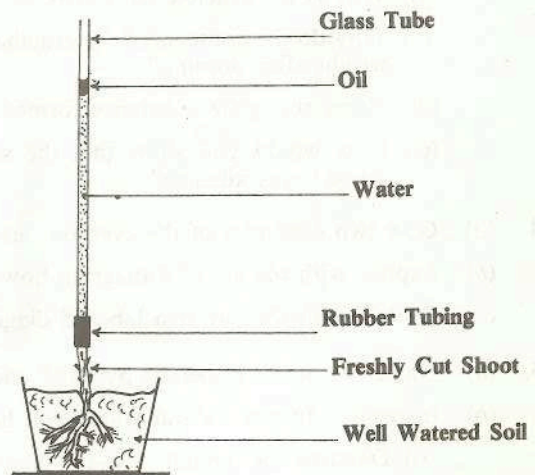
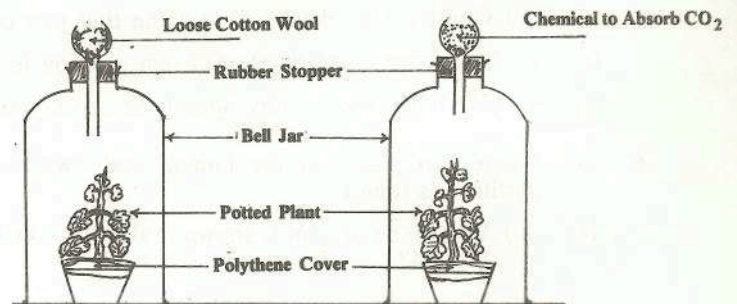


Fig. 17

- (c) (i) In the diagram Fig. 18, which condition for photosynthesis is being investigated?
- (ii) Name another condition necessary for photosynthesis.
- (iii) What, other than oxygen, is the end product of photosynthesis? Describe a test to prove your answer.



Control

Fig. 18

10. (a) The diagram Fig. 19 shows water being heated in a can. When the bunsen is removed the can is sealed with a stopper.
- What happens to the can?
  - Explain your answer.
- (b) (i) What is a mercury barometer used for?
- (ii) Draw a labelled diagram of a mercury barometer showing the normal height of the mercury.
- (iii) What happens to the height of the mercury if the barometer is tilted?
- (iv) What is an altimeter?

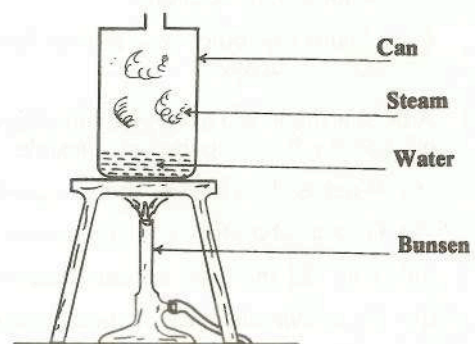


Fig. 19

- (c) Study the diagram Fig. 20.
- If the air in the flask is heated, what will happen to the water level in the glass tube? Give a reason for your answer.
  - Explain how this apparatus could be used as a thermometer.
  - If this apparatus were used as a thermometer, explain why it might give quite different readings on days when the temperature was, in fact, the same.

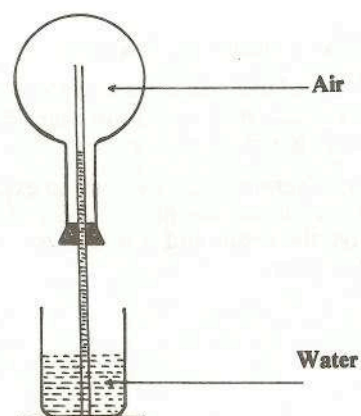


Fig. 20