

INTERMEDIATE CERTIFICATE EXAMINATION, 1977

SCIENCE—SYLLABUS E

THURSDAY 16 JUNE—AFTERNOON, 2 to 4.30

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

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

(a) Name *two* good conductors of electricity and *two* poor conductors of electricity.

(b) Name the parts marked A, B and C in the diagram, Fig. 1.

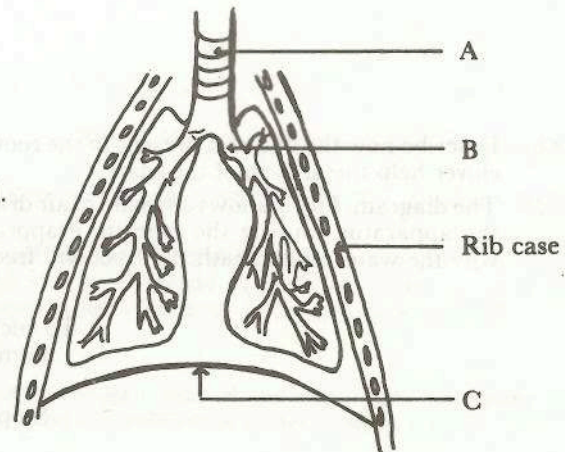


Fig. 1

- (c) Give *one* cause for hardness in water.
 (d) What test would you perform on egg white to see if it contained protein?
 (e) Give one reason why crop rotation is practised in vegetable growing.
 (f) In which of the tubes marked A, B and C in the diagram, Fig. 2, will the level of water rise most?

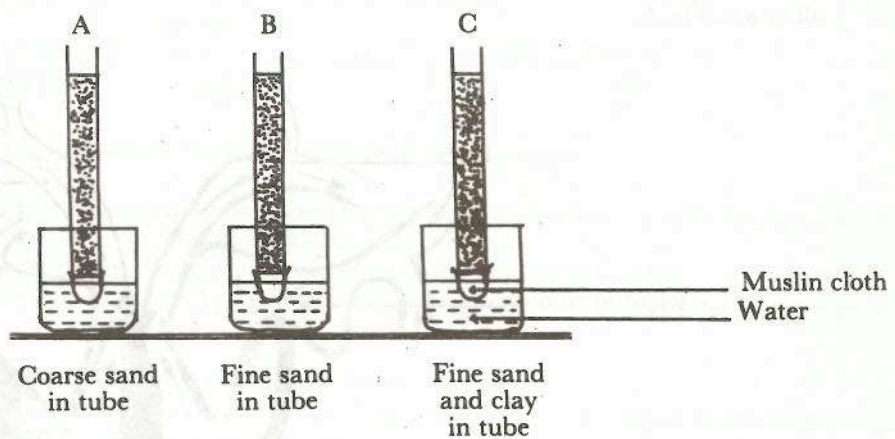


Fig. 2

- (g) Give the names of any *two* terrestrial insects and *two* aquatic insects.
 (h) State which of the following flowers is pollinated by wind and which is pollinated by insects: oak, grass, buttercup; dandelion.
 (i) Explain the changes that will take place in the concentration of the sugar if the experiment, Fig. 3, is left for a period of twenty-four hours.

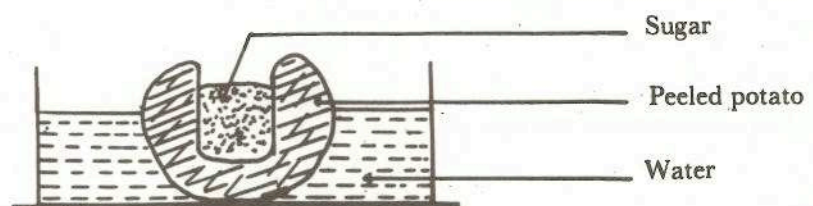


Fig. 3

- (j) Name the parts of the ear marked D, E and F in the diagram, Fig. 4.

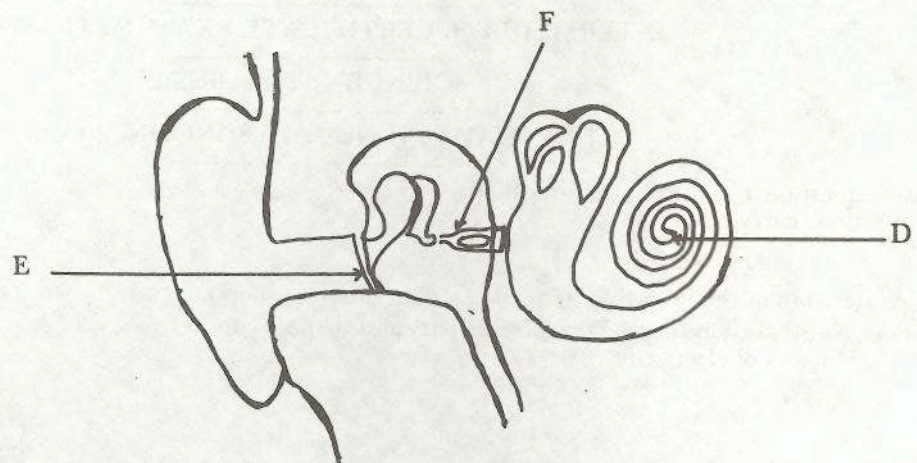


Fig. 4

- (k) Describe how the bacteria present in the root nodules of clover help the growth of the plant.
 (l) The diagram, Fig. 5, shows a stream of air drawn through the apparatus causing the ether to evaporate. Explain why the water underneath the flask will freeze.

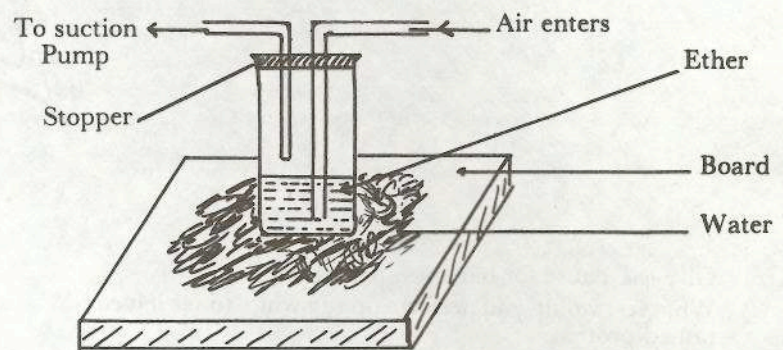


Fig. 5

- (m) Name the parts of the heart marked G, H and K in diagram, Fig. 6.

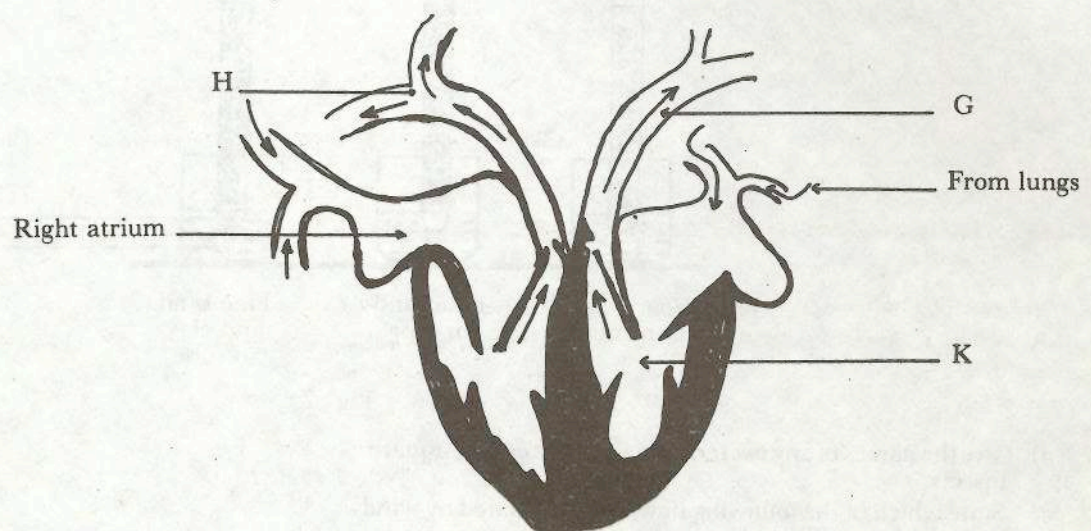


Fig. 6

- (n) Mention one industrial use for yeast.
 (o) What is meant by an echo?

2. (a) Give two examples of everyday use of magnets.
(b) Explain with the aid of a diagram how an iron nail might be magnetised using a bar magnet.
(c) Explain with the aid of a labelled diagram how an electric bell works.
3. (a) Name any *one* parasite of garden plants.
(b) Construct a food chain of at least four links.
(c) In *each* of the following cases, name *one* common plant you would choose in order to illustrate the following:— a tap root; tendrils; a tuber; a corm; a bulb.
4. (a) Name *two* fruits dispersed by wind and *two* fruits dispersed by animals.
(b) Describe an experiment to show that transpiration takes place in plants.
(c) Four fresh leaves, each of known mass, were left hanging for twenty four hours after they had been treated with vaseline as follows:—
Leaf 1 was coated on the upper surface only.
Leaf 2 was coated on the lower surface only.
Leaf 3 was coated on both surfaces.
Leaf 4 remained untreated.
What change, if any, would you expect in the mass of each leaf? Give reasons for your answers.
5. (a) When a small bead of sodium metal is dropped into water, it reacts with it, producing a gas which burns with a "pop". What is the name of the gas?
(b) What results would you expect to obtain when a jar of ammonia gas is tested with (i) moist blue litmus paper, and (ii) moist red litmus paper?
(c) If sulphuric acid and a solution of ammonia are mixed together and the product evaporated, a white crystalline substance soluble in water and often used as a fertilizer remains. What is the name of the crystalline substance and why do you think it is important for a fertilizer to be soluble in water?
6. (a) Name two forms of energy which come from the sun.
(b) The diagram, Fig. 7 shows an experiment set up to investigate one of the conditions necessary for photosynthesis. Study the diagram carefully and state which condition is under investigation.

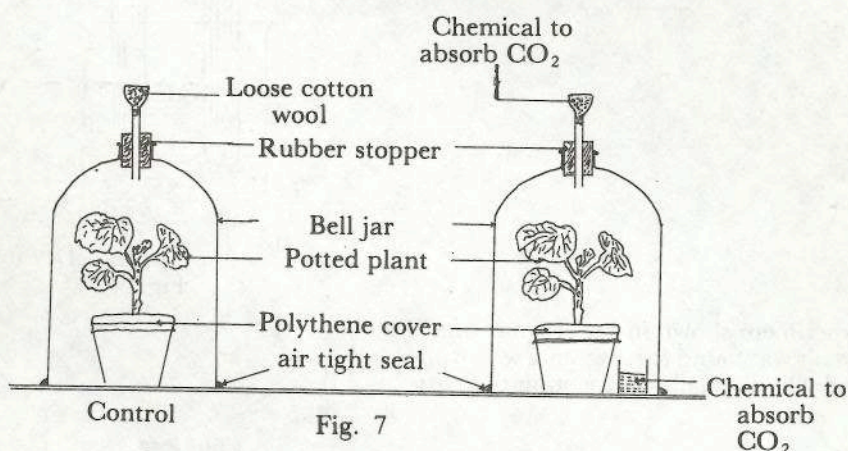


Fig. 7

- (c) Outline the preparation of either oxygen or carbon dioxide in the laboratory.
7. (a) Describe with the aid of diagrams the method you would use in the laboratory to separate *either* a mixture of oil and water *or* a mixture of sand, salt and iron filings.
(b) Explain why ice first forms at the surface of a lake under freezing weather conditions.
(c) Given that the mass of 1 cm³ of gold is 19.3 g describe how you might find out if a sample of metal is pure gold.
8. (a) Mention any *two* places in the body where cartilage is found.
(b) Give *two* examples of hinge joints and *two* examples of "ball and socket" joints found in the mammal.
(c) In the case of a bone immersed in acid, Fig. 8, for one week, it is observed that the immersed part has become flexible and bubbles of gas are given off. (i) What is the name of the gas given off? (ii) How would you do a laboratory test for the gas you name? (iii) State why the part of the bone immersed in acid has become flexible.

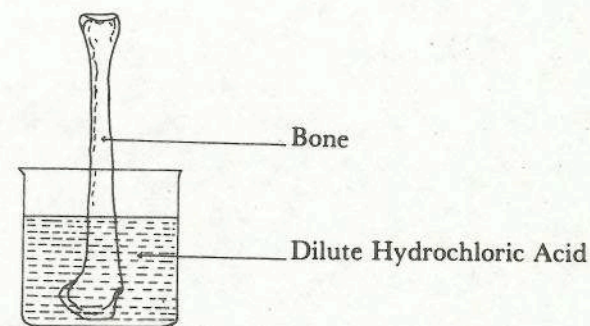


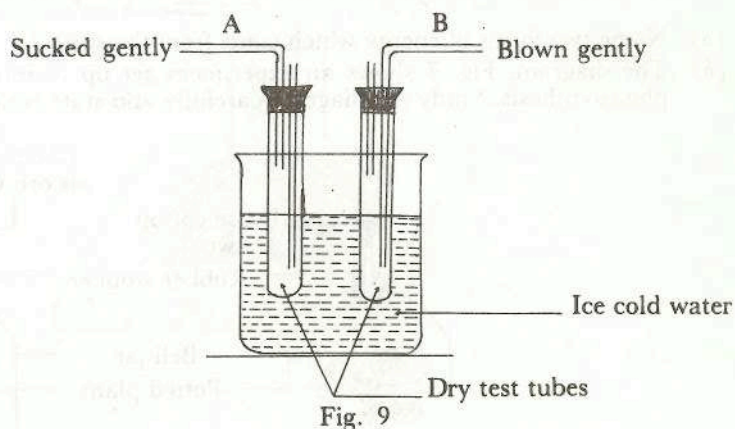
Fig. 8

9. (a) What is humus?
 (b) Describe how you would find out the amount of water in a sample of soil.
 (c) In an investigation to estimate the number of earthworms in different habitats with similar soil types, a class obtained the following results.

Habitat.	Number of earthworms per m ²
Deciduous woodland	450
Pasture land (regularly grazed).	320
Lawn (clippings removed)	26
Cultivated garden	98

Give scientific reasons for the differences in the number of earthworms found.

10. (a) Name *three* common gases found in air.
 (b) If air from the room was gently drawn through test-tube A and exhaled air gently blown through test-tube B, Fig. 9, explain how this experiment would show one difference between inhaled and exhaled air.



- (c) In the experiment shown in Fig. 10 only one of the four nails was found to rust. State which one it was and why the nail you mention did rust.

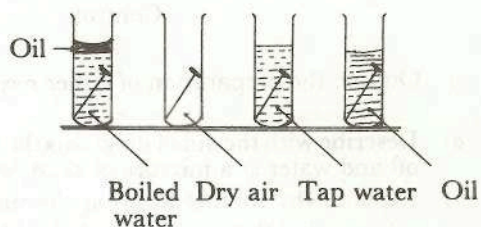


Fig. 10