

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1979

SCIENCE—SYLLABUS E

FRIDAY, 15 JUNE—MORNING, 9.30 to 12.00

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

1. (a) To what group of plants does the organism in diagram Fig. 1. belong?

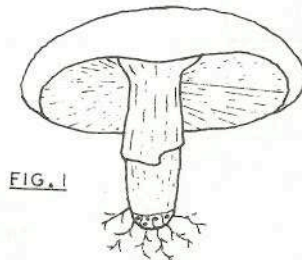


FIG. 1

(b) What (common) compounds are represented by the following symbols:— H_2O , NH_3 , H_2SO_4 .

(c) Why is phosphorus always stored in water?

(d) Three narrow tubes A, B, C of different diameters are placed in water as in diagram Fig. 2.
Why does the water rise most in tube C?

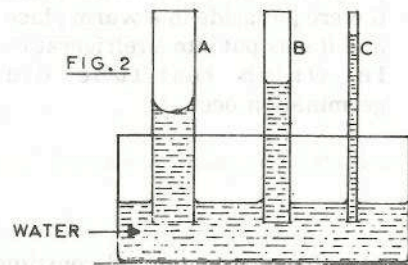


FIG. 2

(e) Diagram Fig. 3 shows two similar containers with equal volumes of boiling water. Explain why the thermometer reading is lower in B than in A after a period of time.

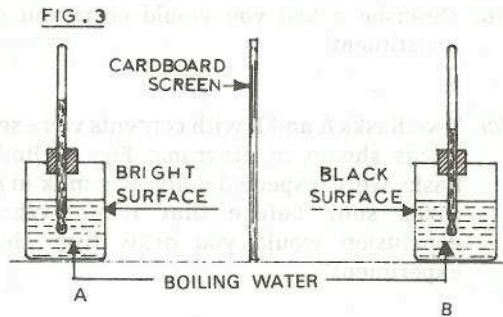


FIG. 3

(f) Diagram Fig. 4 is the mammalian eye. Name the parts marked A, B and C

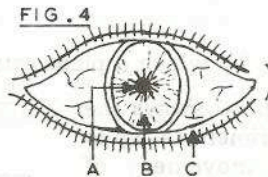


FIG. 4

(g) State which of the following plant organs is shown in the diagram Fig. 5.

- (i) Bulb;
- (ii) Swollen root.



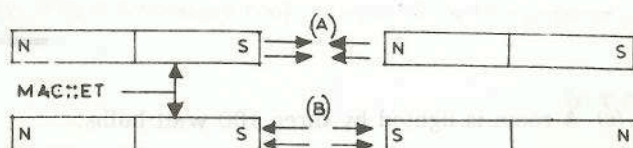
FIG. 5.

(h) What is an echo?

(i) How does lime affect the structure of soil?

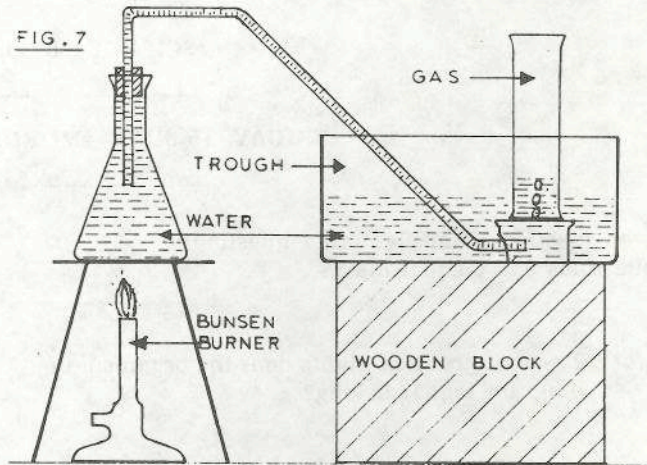
(j) The magnets in B move away from each other while the opposite occurs in A. What property of magnetism is explained by these results?

FIG. 6

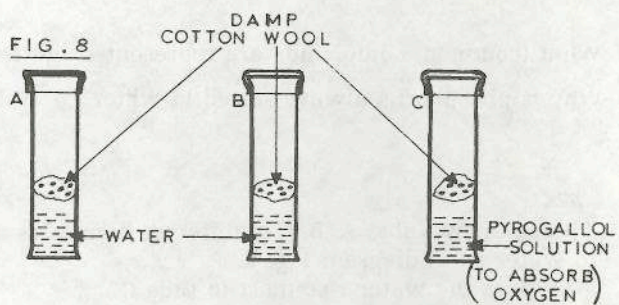


- (k) Why will a thick-walled glass vessel crack when boiling water is poured into it?
- (l) Which of the following is nearest to normal body temperature: 14°C, 39°C, 54°C?
- (m) By crossing homozygous red and homozygous white cattle, roan cattle are produced. Using the letters *R* and *r* to represent the genes producing red coat and white coat respectively, write down the genotype of the F_1 cattle.

- (n) What gases collect in the gas-jar shown in diagram Fig. 7?

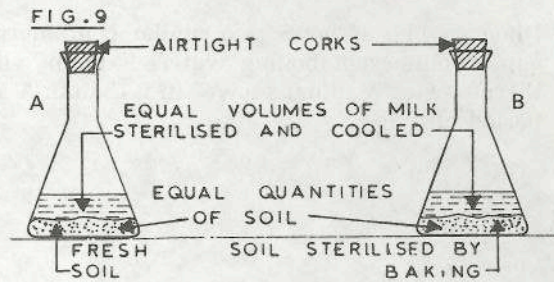


- (o) Soaked cress seeds are placed on the damp cotton-wool in test-tubes A, B and C. Test-tubes A and C were put aside in a warm place and B was put into a refrigerator. In which test-tube did germination occur?



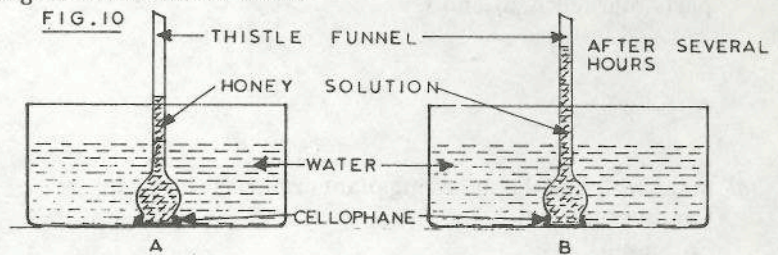
- 2. (a) State four essential food constituents of a balanced diet.
- (b) Describe a test you would carry out on a sample of milk to show the presence in it of any food constituent.

- (c) Two flasks A and B with contents were set up as shown in diagrams Fig. 9. Both flasks were inspected daily. The milk in A turns sour before that in B. What conclusion would you draw from this experiment?



- 3. (a) Name the process by which a plant gets rid of excess water.

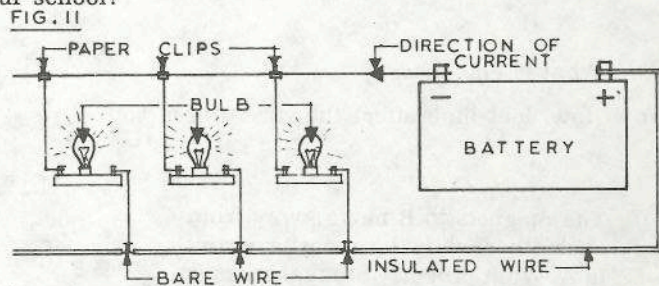
- (b) The diagram Fig. 10 shows the result of an experiment set up to investigate the movement of water through cellophane. Explain why the level of honey solution has risen in B?



- (c) Describe how the root absorbs water from the soil.

- 4. (a) At what voltage is electricity supplied to your school?

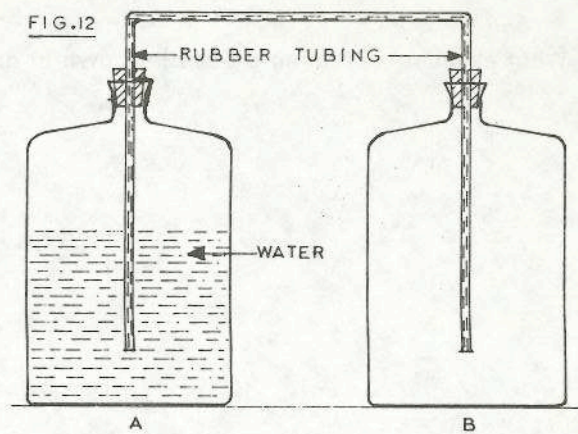
- (b) Study the diagram Fig. 11.
 - (i) Why are the bulbs lighting?
 - (ii) If one of the bulbs is removed from its socket, how will the other bulbs be affected?



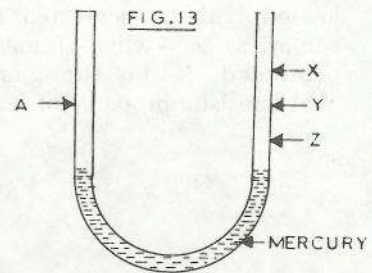
- (c) A room is lighted by three 100 watt bulbs.
 - (i) How many units of electricity are used in 5 days?
 - (ii) At 4.94p per unit how much does it cost?

5. (a) Why does an astronaut weigh less on the moon than on the earth?

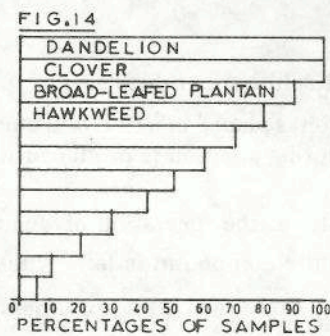
(b) Two equal-sized glass bottles are set side by side, one full of water and the other empty as in diagram Fig. 12. When the rubber-tubing, filled with water, is lowered into B, water flows from A. For how long will this flow of water continue and state the reason for your answer.



(c) The diagram Fig. 13 shows a U-tube containing balancing columns of alcohol and water. If A marks the top of the water column, state which of the three levels X, Y or Z marks the top of the alcohol column.



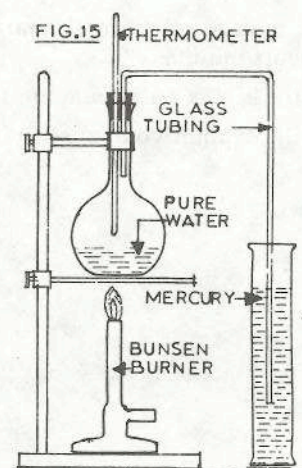
6. (a) Name four organisms you found in a habitat you have studied.
 (b) Describe some method by which man could cause a change in the plant or animal population of this habitat.
 (c) The histogram shown below was made by a pupil who studied weeds in a school lawn.



What percentage of samples contains dandelions and what percentage contains each of the other weeds?

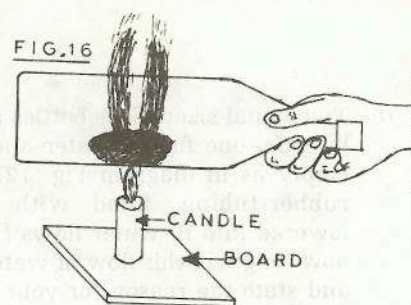
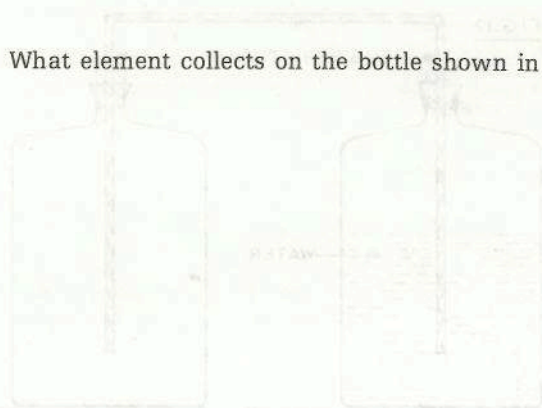
7. (a) State one reason for the fact that a wet road will dry faster on a warm day than on a cold day.

(b) The pure-water in the flask in diagram Fig. 15 boils at the thermometer reading 105°C. Explain why the boiling point of the water is above 100° in the particular situation.

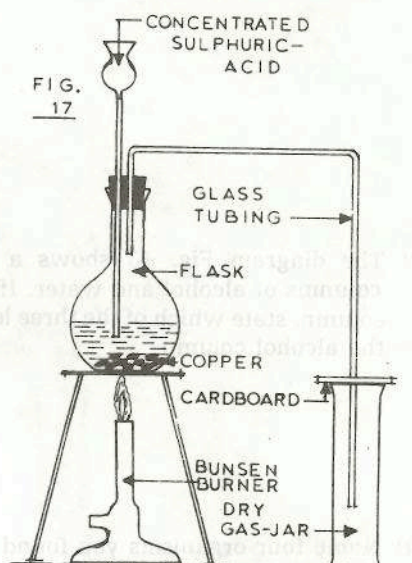


(c) Water at 100°C is required to brew tea properly. Why is a pressure cooker required for this purpose at high altitude?

8. (a) What element collects on the bottle shown in diagram Fig. 16?



- (b) When the copper in the flask shown in Fig. 17 is heated with concentrated sulphuric acid, a colourless gas which fumes in moist air is produced. Name the gas and state one characteristic property of it.



- (c) Explain clearly why a match tip flares up suddenly when you strike it on the surface of a safety match box.

9. (a) What information about a chemical solution can blue litmus provide?

(b) A small volume of bread-soda solution is placed in a dish and changes red litmus paper to blue. Sour milk is added to it, drop by drop, until a solution is produced which has no effect on either blue or red litmus paper.

(i) Name the process which results in the formation of this neutral solution.

(ii) If this solution is heated, a white compound is left. What pH is this compound?

(c) Why is bread-soda solution applied to a wasp sting on a person's body?

10. (a) Name two gases transported by the blood in the human body.

(b) Make a labelled diagram of the mammalian heart and show with arrows the course of the blood through this organ.

(c) A man has a normal heart-rate of 72 beats per minute. After exercise it increases to a rate of 110 beats/minute.

(i) Is this an advantage to the man involved?

(ii) Explain your answer.