

INTERMEDIATE CERTIFICATE EXAMINATION, 1975

SCIENCE—SYLLABUS E

E

WEDNESDAY, 18 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) The line A B represents a ray of light about to enter the prism, Fig. 1. Draw a diagram of the prism and continue the line to show the path taken by this ray as it passes through the prism.
- (b) List the food constituents present in whole milk.
- (c) What would be the genotypes of the offspring resulting from the cross, Tall plant (TT) x dwarf plant (tt)?
- (d) State which of the following plant organs is shown in the diagram Fig. 3.
 - (i) Bulb.
 - (ii) Corm.
- (e) What compound is formed when sodium reacts with water?
- (f) Study the diagram Fig. 5 and say whether the markerdrop will move more to the left or to the right if the experiment is left to stand for some time.

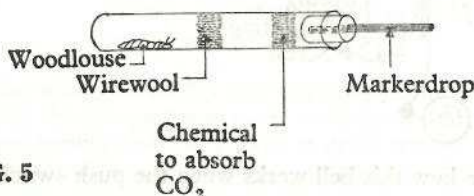
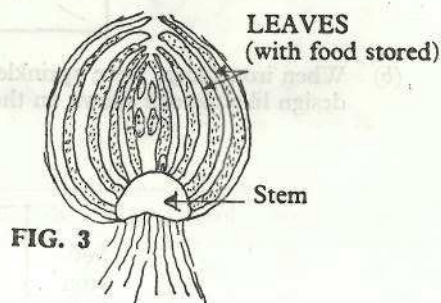
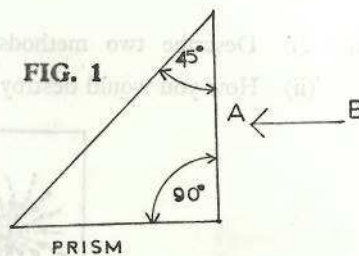
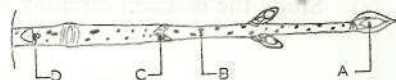
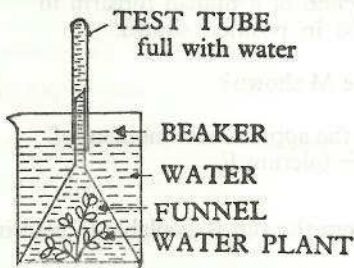


FIG. 5



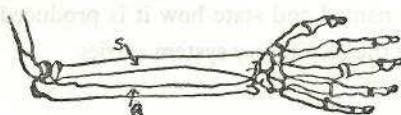
- (g) Name the parts of the Winter twig labelled A, B, C, D in the diagram.
- (h) Briefly outline the differences in the composition of the blood in the right and the left ventricles of the heart.
- (i) If the apparatus shown in the diagram was placed in bright sunlight for four hours, what changes would you expect to see inside the test tube?



(j) Complete this table. The first one is completed for you.

Compound	Iron oxide	Sulphur dioxide	Table Salt	Sugar
Elements	Iron, oxygen			

- (k) What affect would you expect an application of lime to have on a the pH of a garden soil?
- (l) What effect would the following substances have on moist blue litmus paper; hydrochloric acid, new milk, sour milk, vinegar?
- (m) How would you test for starch in a sample of food?
- (n) If electricity costs 1.8p per unit, what will it cost to use a one-bar heater (1 Kw) for four hours?
- (o) Write down the names of the bones R and S.



2. (a) Explain why a layer of cream forms on top of whole milk which has been left standing for a time.
 (b) Three liquids were poured into a beaker shaken up and left to stand. When they had settled down the appearance was like that shown in the diagram Fig. 7.

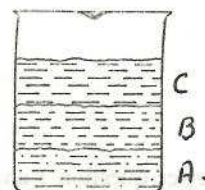
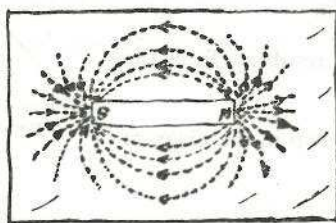


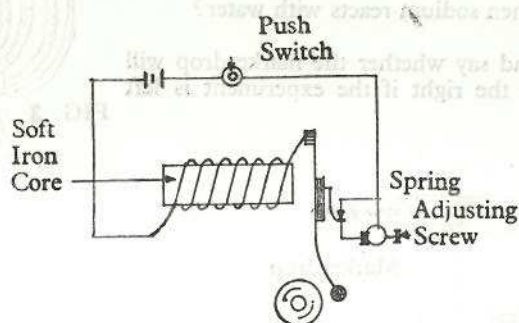
FIG. 7

- (i) Which liquid A, B or C has the greatest density?
 (ii) If A is mercury and C is water why cannot B be a solution of sugar and water?
 (c) Explain why water enters a syringe when the mouth is immersed in the water and the plunger is drawn out.

3. (a) (i) Describe two methods for making magnets.
 (ii) How you would destroy the magnetism in a soft iron bar magnet?



- (b) When iron filings were sprinkled on to a sheet of paper placed over a magnet on a bench, they formed a design like the one shown on the diagram. Explain.



- (c) Study the diagram carefully and then describe how this bell works when the push switch is pressed.

4. (a) Study the diagram Fig. 4.1 and state whether it would be easier to lift a stone S by pushing down the board at A or at B. Explain the reason for your answer.

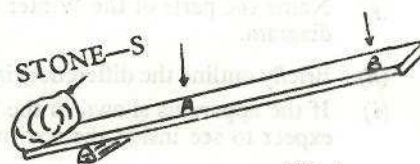


Fig 4.1

- (b) Give two **other** examples of the use of levers in everyday life.

- (c) The sketch Fig. 4.2 illustrates the action of a human forearm in which a book of weight 50N is held in position shown.

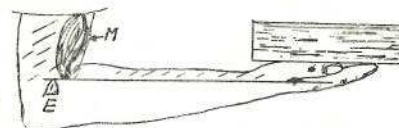


FIG. 4.2

- (i) What is the name of the Muscle M shown?

- (ii) Show how you would calculate the approximate moment of the force caused by the book about the fulcrum E.

5. (a) Use examples to show that energy from the sun is available to man in at least **three** different forms.
 (b) Explain what is meant by an echo.
 (c) Fig. 5.1 is a diagram of the eye. Name the parts labelled K, L, M and N.

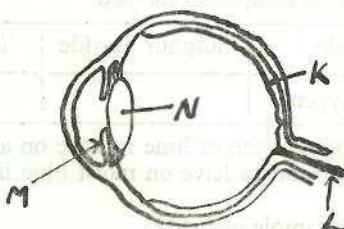
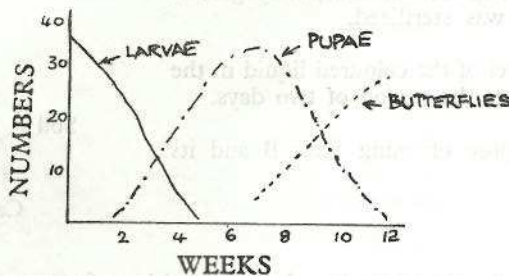


FIG. 5.1

6. (a) Name **two** gases in the air which are useful to most living things.
 (b) Take any **one** of the gases you have named and state how it is produced in nature.
 (c) Describe with the aid of a sketch how the respiratory system carries out its function.

7. (a) List **three** plants and **three** animals you found in a named habitat you have studied.
 (b) (i) What special features of the plants or the habitat or both encouraged the survival of the plants you found there?
 (ii) In what way did the habitat provide a supply of food for the animals you found there?
 (c) The graph shows the changes which took place over a period of twelve weeks in the number of larvae, pupae and butterflies counted in the vicinity of a cabbage plot in the school garden. How would you account for these changes?



8. (a) A rabbit is a herbivore. Explain.
 (b) Fig. 8-1 is a diagram of part of the digestive system. Name the parts marked M, N, O, P, R, and write with a short note on the function of **any one** named part.

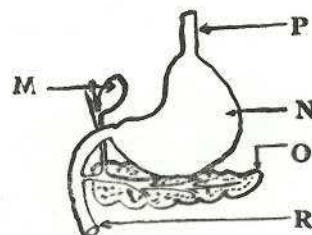


FIG. 8-1

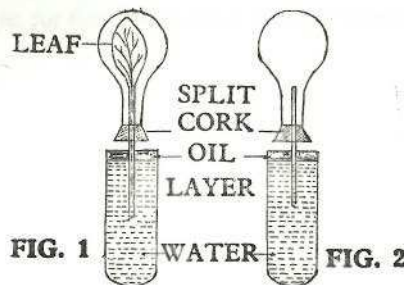
(c)

Month	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Temperature of Air °C	9	8	7	7	8	10	12	14
Temp. of Compost Heap	32	34	34	34	35	33	30	27

The table shows the average monthly mid-day temperature of air and also at a depth of 50 cm in a compost heap taken from the time the compost was made until the following June. By June the volume of the compost heap had decreased considerably and the growth of grass around the base was much more advanced than farther out. Give reasons for (i) the difference in the temperatures of the air and the compost heap from November till June,

- (ii) The decrease in volume of the compost heap,
 (iii) The more advanced growth of grass around the base of the compost heap.

9. (a) The diagrams show an experiment set up to investigate water uptake and evaporation in a leaf



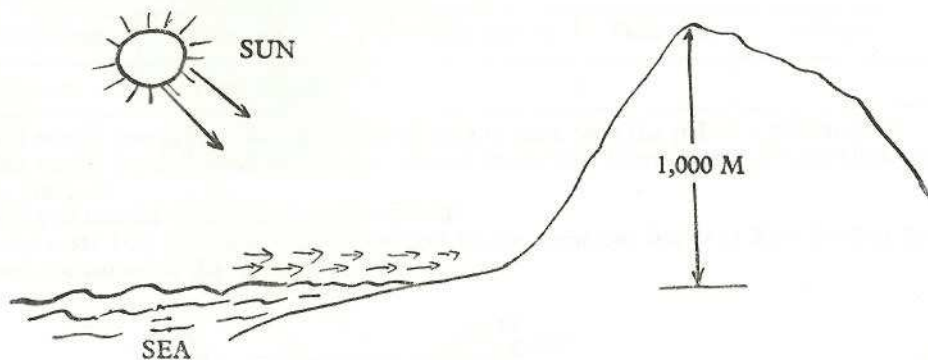
(i) After a few hours, what changes would you expect to find on the inner surface of the flask and in the level of the water in the test tube in Fig. 1? Give reasons for your answer.

(ii) What is the purpose of the experiment in Fig. 2?

- (b) (i) Explain why well water is generally harder than rain water.
 (ii) How can hardness be removed from water?

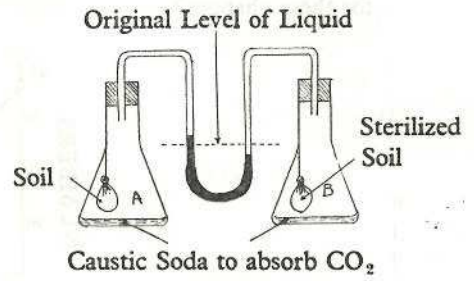
(c) The diagram shows the movement of an air current filled with water vapour.

- (i) Explain why air currents generally move from the sea towards the land by day,
 (ii) What will happen to the water vapour in the air current as it rises up the side of the mountain? Explain.



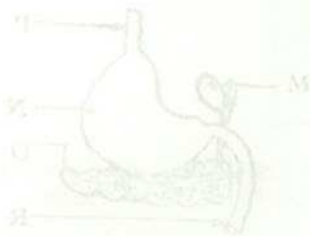
10. (a) Why, under normal storage conditions, will a sample of unpasteurised milk sour faster than a pasteurised sample?

(b) The diagram shows an experiment at the end of two days, which was set up to show the presence of micro-organisms in soil. The bag in flask A contained ordinary garden soil; the soil in flask B was sterilized.



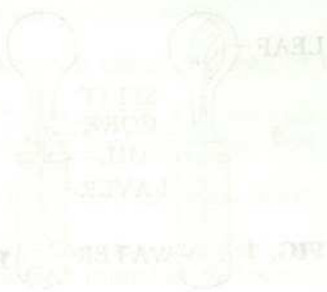
- (i) Explain why the level of the coloured liquid in the U tube changed over the period of two days.
- (ii) What was the purpose of using flask B and its contents?

(c) (i) Name any disease of crops or garden plants caused by a fungus.
 (ii) What steps would you take in order to prevent an outbreak of the disease you named.



Month	Jan	Feb	Mar	April	May	June
Temperature of air (°C)	8	7	8	10	12	14
Volume of compost heap (litres)	11	11	14	12	9	7

The table shows the average monthly rainfall and the volume of air and also in a depth of 50 cm for a compost heap. The temperature of the air and the volume of the compost heap are also shown. The volume of the compost heap is shown in litres. The volume of the compost heap is shown in litres. The volume of the compost heap is shown in litres.



The diagram shows a cross-section of a plant stem. The parts are labeled LEAF, BUD, and LAYER. The diagram shows a cross-section of a plant stem. The parts are labeled LEAF, BUD, and LAYER.

