

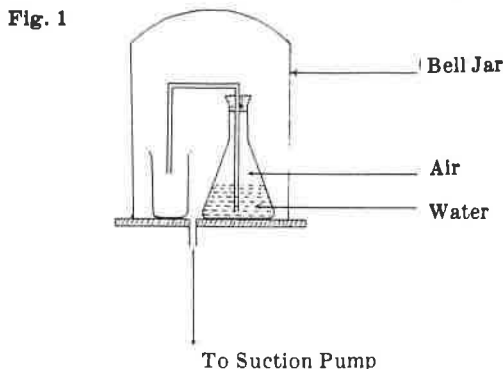
SCIENCE—SYLLABUS E

WEDNESDAY, 16 JUNE—MORNING, 9.30 to 12.00

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

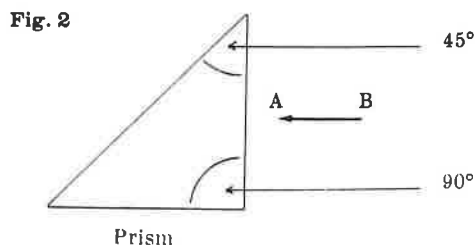
1. Answer *ten* of the following items. (Keep your answers short)

- (a) Name *two* ways by which a magnet can be demagnetised.
- (b) On what part of a plant are lenticels found?
- (c) In the diagram Fig. 1, what will happen when air is withdrawn from the bell-jar?



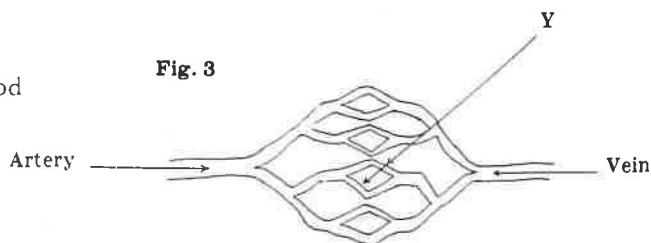
- (d) What is the union of the female egg and the male sperm called in the reproduction of mammals?
- (e) What organism would you expect to find in the root nodule of a clover plant?

(f) In the diagram Fig. 2, the line AB represents a ray of light. Draw a diagram of the prism and continue the line to show the path taken by this ray as it passes through the prism.



- (g) A razor blade can be made float on water. What does this demonstrate?
- (h) What is meant by the Atomic Number of an element?

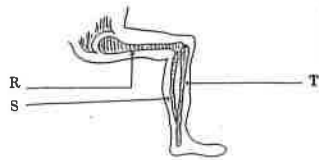
(i) In the diagram Fig. 3, what are the tiny blood vessels marked Y called?



(j) What effect would an application of lime have on the pH of garden soil?

(k) Name the bones marked R, S, and T in the diagram of the human leg Fig. 4.

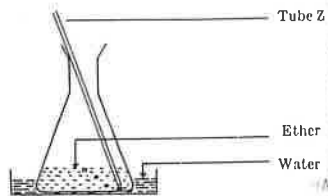
Fig. 4



(l) What causes temporary hardness in water?

(m) In the diagram Fig. 5, what will happen when a current of air is passed through tube Z?

Fig. 5



(n) If the offspring of a cross between two plants were all tall (Tt) in the F₁ generation, what was the genotype of each of the parent plants?

(o) In what way does the skin of a mammal assist in the regulation of body temperature?

2. (a) What are annual plants? Give *one* example.

(b) The apparatus in the diagram Fig. 6, is set up to show that a particular factor is necessary for the germination of seeds.

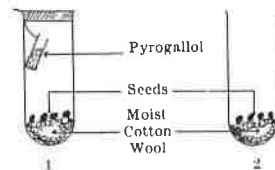
(i) List *three* conditions necessary for germination.

(ii) What is the aim of the experiment which is set up in the diagram?

(iii) Why is the pyrogallol placed in test tube 1?

(iv) Test tube 2 serves as a control. What is the purpose of a control in such experiments?

Fig. 6



(c) The diagram Fig. 7, shows a simple flower.

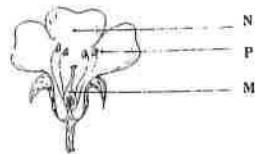
(i) Name the parts marked M, N and P.

(ii) Give *one* function of the part marked M.

(iii) What is meant by pollination?

(iv) Give *one* difference between an insect pollinated and a wind pollinated flower.

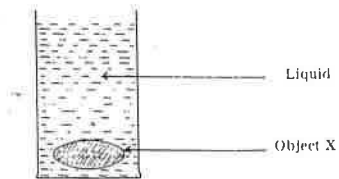
Fig. 7



3. (a) Name *two* factors which affect the pressure acting on the object X, in the diagram Fig. 8.

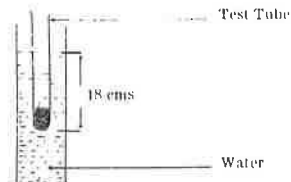
(b) Describe an experiment to show that a floating object displaces its own weight of liquid.

Fig. 8



(c) In the diagram Fig. 9, a loaded test tube floats vertically in water with 18 cms. of the tube below the surface. How much further will it sink if placed in a liquid of density 0.9 g/cm³?

Fig. 9



4. (a) State the location and function of the gall-bladder.
- (b) Draw a sketch of the human digestive system, and carefully label *five* parts.
- (c) The table Fig. 10, shows the results of an experiment on the breakdown of starch by an enzyme.

Temperature °C	Rate of breakdown of starch
7	4.1
17	10.6
27	17.3
37	22.0
47	18.3
57	8.3

Fig. 10

5. (a) In what way is burning similar to rusting?
- (b) Describe an experiment to show the conditions necessary for rusting to occur.

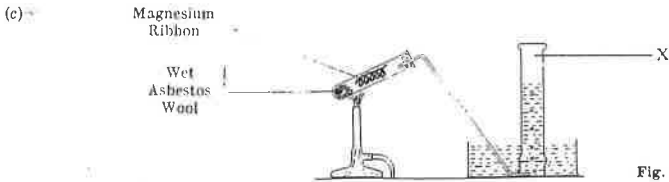


Fig. 11

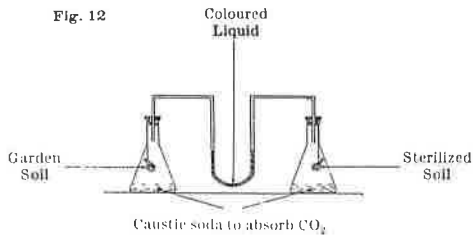
In the diagram Fig. 11, magnesium ribbon is burned in the presence of wet asbestos wool. The magnesium burns brightly and changes to a white powder, while at the same time a colourless gas collects at X.

- (i) What is the white powder called?
- (ii) Name the colourless gas.
- (iii) How would you test this gas?
- (iv) Write the equation for the reaction which occurred.

6. (a) What is humus?

- (b) The diagram Fig. 12 shows an experiment which was set up to show the presence of micro-organisms in the soil.

Fig. 12



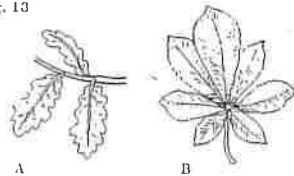
- (i) What are micro-organisms?
- (ii) What is the difference between normal soil and sterilized soil?
- (iii) What will be the result of the experiment? Give a reason for your answer.

- (c) Sulphate of ammonia is a salt which is soluble in water and often used as a garden fertilizer.

- (i) Name the chemicals used in the making of sulphate of ammonia.
- (ii) Why is it important for a fertilizer to be soluble in water?
- (iii) Which of the major elements for plant growth is supplied by sulphate of ammonia?
- (iv) Explain the term 'salt'.

7. (a) The diagram Fig. 13, shows two leaves A and B. Name a tree in each case which has leaves similar to these.

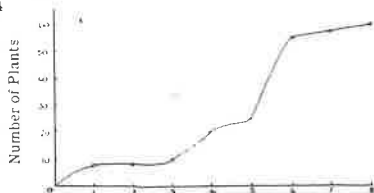
Fig. 13



- (b) (i) Name *five* pieces of equipment which you used in the study of ecology.
- (ii) In the case of any *one* of the pieces you mention, describe how it was used in any ecological investigation which you helped carry out.

- (c) During a study of the area under a large tree in open ground, the number of green plants found at various distances from the base of the tree was recorded. The results were graphed as shown in the graph Fig. 14.

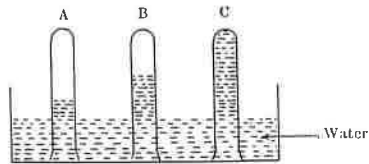
Fig. 14



What conclusions do you draw from these results? Give reasons for your answer.

8. (a) Name *two* allotropes of carbon.
- (b) Describe how you would prepare and collect a sample of carbon dioxide in the laboratory.
- (c) Three test tubes containing equal volumes of ammonia, oxygen and carbon dioxide were inverted in a trough of water. After some time the water rose to the levels shown in the diagram Fig. 15.

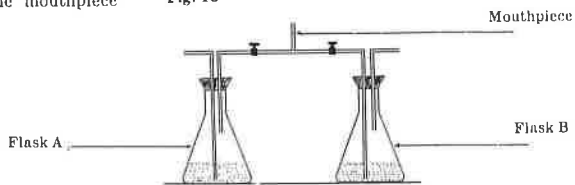
Fig. 15



- (i) Which test tube do you think contained carbon dioxide?
- (ii) What substance was formed when the carbon dioxide reacted with the water?
- (iii) What effect would this substance have on moist litmus paper?
- (iv) What effect would this substance have on limestone?

9. (a) Name the blood vessel which brings oxygenated blood from the lungs back to the heart.
- (b) The apparatus in the diagram Fig. 16 was used in an experiment on respiration. A student breathes in and out through the mouthpiece about twenty-five times.

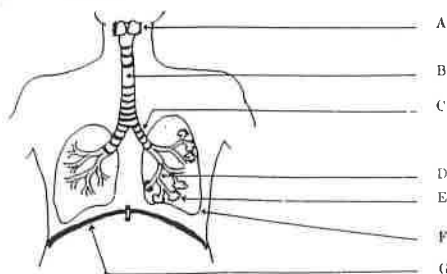
Fig. 16



- (i) What is the purpose of this experiment?
- (ii) Name the liquid in flask B.
- (iii) Through which flask is the air drawn in?
- (iv) What will be the result of this experiment?

- (c) (i) Name any *five* parts marked A, B, C, D, E, F, G, in the diagram Fig. 17.
- (ii) Describe the function of part G in breathing.

Fig. 17



10. (a) Name *two* ways by which heat is transferred.
- (b) Describe how you would construct a simple mercury thermometer.

- (c) (i) In the diagram Fig. 18, a flask which is connected to a pressure gauge is placed in hot water. How will the pressure in the flask be affected and give a reason for your answer?
- (ii) Explain why food can be cooked much more quickly in a pressure cooker than in an ordinary saucepan.

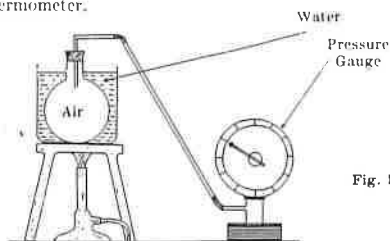


Fig. 18