INTERMEDIATE CERTIFICATE EXAMINATION, 1966

SCIENCE (Syllabus B)

WEDNESDAY, 15th JUNE - Morning, 10 to 12.30

(Not more than six questions are to be attempted. Two questions at least must be answered from each Section. Illustrate your answers wherever possible).

SECTION I

1. (a) Water is poured into one arm and alcohol into the other arm of a U-tube containing mercury. When the mercury columns are balanced, the water column is 16 cm. high and the alcohol column is 20 cm. high.

(i) Illustrate the above experiment by means of a labelled diagram.
(ii) Calculate the density of alcohol. Explain your method.

(b) Describe how you would measure the density of mercury. (66 marks)

2. (a) Describe how you would set up a simple barometer in the laboratory using a glass tube and some mercury.
Show, on a diagram, how you would measure the barometric height on this barometer.

(b) (i) Why does the mercury not fall to the bottom of the tube when the barometer is standing upright ?
(ii) What would you expect to happen if the barometer were placed in a vessel from which the air had been removed ?

(66 marks)

3. (a) Describe an experiment to show that alcohol expands more than water does when heated under the same conditions.

(b) When a liquid expands, explain what changes, if any, take place in its (i) volume (ii) mass (iii) density.

(67 marks)

4. Hydrogen is generated in a flask A and bubbled through a drying bottle B containing concentrated sulphuric acid. It is then passed over a boat of strongly heated iron oxide, contained in a combustion tube C. A delivery tube leads from C to a test-tube D standing in a beaker of cold water.

(i) Draw a labelled diagram of the apparatus described above.
(ii) Explain fully what takes place in C and D.
(iii) Name one physical change and one chemical change that occur during this experiment.
(iv) State briefly a conclusion you would draw from this experiment.

(66 marks)

5. (a) Name the gases normally found in atmospheric air.

(b) Describe how you would burn magnesium in a crucible.

(i) What change occurs in the appearance of the magnesium ?
(ii) Is the residue an element or a compound ?
(iii) Is the change that took place a physical or a chemical change ?
(iv) Why should the residue be heavier than the original magnesium ?

(67 marks)

SECTION II

6. (a) Illustrate, by means of a labelled diagram, the structure of a green leaf. Show, on the diagram, by arrows and names what gases enter and leave the plant via the leaves.

(b) A covered jar contains a leafy shoot in a beaker of water and a candle. If the candle is lit and the jar sealed, the candle is extinguished after a short time. When, however, the jar is placed in a sunny position and the candle is lit, it is not extinguished but continues to burn.
Suggest an explanation for the above. (66 marks)

7. (a) Draw labelled diagrams to show (i) the structuve of a named seed and (ii) the stages in the germination of this seed.

(b) Name the conditions necessary for the germination of seeds.
How would you show experimentally that any one of these conditions was necessary ?

(66 marks)

8. (a) Describe what occurs during leaf-fall. Draw a labelled diagram showing the appearance of a named twig after leaf-fall.

(b) If the leaf is so important to the life of a tree, how do trees that lose their leaves, survive during winter ? (67 marks)

9. (a) Make a detailed diagram showing the structure of the skin of a mammal.

(b) State the functions of the skin. How does the skin perform these functions ?

(66 marks)

10. What are the properties by which living things are distinguished from non-living things ? Explain why animals and plants are placed in different groups of the living kingdom.

(67 marks)