

INTERMEDIATE CERTIFICATE EXAMINATION, 1963.

SCIENCE (Syllabus B).

FRIDAY, 14th JUNE. — Evening, 3 to 5.30.

(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) What is meant by atmospheric pressure?
 (b) Describe, with the aid of a diagram, how to construct a simple mercury barometer; explain how the column of mercury in the tube is supported.
 (c) What weather conditions would you expect when the atmospheric pressure is
 (i) high, (ii) low, (iii) falling quickly?
 (66 marks.)
2. (a) Define and briefly explain specific gravity.
 (b) State the Principle of Archimedes and describe an experiment which demonstrates the principle.
 (c) A diver weighs 140 lbs. and his body has a volume of 3 cubic feet. His outfit weighs 60 lbs. and has a volume of a $\frac{1}{2}$ cubic foot. What extra weight must be inserted in his outfit so that he will sink in fresh water?
 (1 cubic foot of fresh water weighs 62.5 lbs.)
 (66 marks.)
3. The following table shows the temperature readings, which were taken minute by minute, while a metal was being heated in a crucible:
- | Time (mins.) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Temp. (°C.) | 310 | 317 | 322 | 325 | 327 | 327 | 327 | 327 | 328 | 332 | 338 | 346 |
- (a) Plot these figures on a graph to show how the temperature changes with time.
 (b) What happens in the crucible from the 5th to the 8th minute?
 What information does the graph give in this connection?
 (c) If after the 12th minute the metal were allowed to cool, what changes would take place?
 (66 marks.)
4. (a) Describe experiments you would perform to examine the conditions under which iron rusts.
 (b) Is rusting a physical or a chemical change? Give reasons for your answer.
 (c) Explain a method by which you could change the rusted iron back to iron.
 (67 marks.)
5. (a) How would you separate the ammonium chloride from a mixture of ammonium chloride and sand?
 (b) Explain the terms acid, alkali, salt, giving one example of each.
 How would you prepare a pure sample of common salt from an acid and an alkali?
 Name all the substances used.
 (67 marks.)

SECTION II.

6. (a) Name three common gases found in the atmosphere.
 (b) Explain the important part played by two of these gases in the life processes of humans and plants.
 (c) Describe how you would prepare and collect these two gases in the laboratory.
 (66 marks.)
7. (a) What do you understand by vegetative reproduction?
 Describe and illustrate four types of vegetative reproduction and name one example of each.
 (b) What function does each of the following plant parts perform:
 tendril, hair root, guard cells, stamen, calyx?
 (66 marks.)
8. (a) Why has the green leaf been called a 'factory'?
 State in three vertical columns: (i) the various raw materials used by the leaf, (ii) where each raw material comes from, (iii) how it gets to the leaf.
 (b) The work of the leaf is termed photosynthesis; what conditions are necessary for photosynthesis to take place?
 Describe two experiments in support of your answer.
 (67 marks.)
9. (a) What functions does the skin perform? Describe, with the aid of a labelled diagram, the structure of the skin.
 (b) What precautions are necessary to ensure that the skin functions properly?
 (66 marks.)
10. (a) Describe any one type of joint found in the human skeleton.
 (b) Give a brief account of the structure of the backbone and the ribs. Explain why correct posture when walking and sitting is so important with regard to general health.
 (c) Write explanatory notes on the functions of each of the following:-
 (i) the diaphragm, (ii) the pancreas, (iii) the white corpuscles of the blood.
 (67 marks.)