

## INTERMEDIATE CERTIFICATE EXAMINATION, 1964.

## SCIENCE (Syllabus A).

WEDNESDAY 10th JUNE—Evening, 3 to 5.30.

(Not more than six questions are to be attempted, of which three must be taken from Section I, and three from Section II. Illustrate your answers by means of diagrams wherever possible.)

## SECTION I.

1. Explain what you understand by (i) a lever, (ii) a fulcrum, (iii) a force, (iv) centre of gravity.

State the law of the lever and describe an experiment in support of your answer. Given a 20 gm. weight, describe how you would find the mass of a given lever.

(66 marks.)

2. Define (i) density, (ii) specific gravity.

Describe fully how you would use (i) a U-tube, (ii) Hare's apparatus, to compare the densities of two liquids.

When a body is weighed in water it appears to lose 40% of its weight. Find the specific gravity of the body.

(66 marks.)

3. Give a full account, with the aid of a diagram, of how you would construct a mercury barometer. Show how you would use the barometer to measure the pressure of the atmosphere.

Explain what happens when (i) a few drops of water are introduced into the barometer, (ii) the barometer is taken up a mountain.

(66 marks.)

4. State what you understand by conduction of heat. Give two examples of good conductors and two examples of bad conductors.

Define the coefficient of linear expansion of a solid and describe fully how you would measure it in the case of iron.

(67 marks.)

5. What do you understand by (i) a calorie, (ii) specific heat, (iii) latent heat?

Describe fully how you would measure the latent heat of steam.

A calorimeter, of water equivalent 5 gm., contains 25 gm. of a liquid, of specific heat 0.6, at 15°C. Two grams of water at 92°C. were added to the mixture and the mixture was stirred. Find the temperature of the mixture.

(67 marks.)

## SECTION II.

6. Describe any six of the following substances with regard to appearance, effect of water (if any), effect of heat (if any):— (i) sodium bicarbonate, (ii) calcium carbonate, (iii) ammonium nitrate, (iv) potassium nitrate, (v) ammonium chloride, (vi) sodium chloride, (vii) potassium permanganate, (viii) crystalline ferrous sulphate.

(66 marks.)

7. Describe and give an example of each of the following processes:— (i) crystallisation, (ii) decantation, (iii) filtration, (iv) evaporation, (v) distillation.

What do you understand by fractional distillation? In your answer draw a diagram of the apparatus you would use and describe how you would use it.

(66 marks.)

8. Name any six oxides and describe briefly their properties in each case.

Give an account of the preparation of each of any three of the oxides you have named.

(66 marks.)

9. Give an account of the preparation and properties of hydrogen.

Describe, with the aid of a diagram, an experiment in which dry hydrogen is passed over a heated substance. Name the substance and state what deductions may be drawn from the experiment.

(67 marks.)

10. State what you understand by allotropy.

Name four allotropes of carbon and four allotropes of sulphur. Give an account of the properties of the allotropes you have named. (The preparation of the allotropes is not required.)

(67 marks.)