AN ROINN OIDEACHAIS.

(Department of Education)

INTERMEDIATE CERTIFICATE EXAMINATION, 1960.

SCIENCE (Syllabus E).

WEDNESDAY, 15th JUNE.—EVENING, 3 TO 5.30.

[Not more than *six* questions to be attempted. Illustrate your answers wherever possible.]

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1. State the law of flotation and describe an experiment to demonstrate it in the case of a liquid other than water.

Describe a direct-reading hydrometer and explain how it is used to measure the density of a liquid.

A solid cylinder floats vertically in water with 9 cms. of its length beneath the surface. How much of its length will be beneath the surface when it floats in a liquid of specific gravity 0·8 ?

[66 marks.]

2. Describe fully how a mercury barometer is constructed and how it is used to measure the pressure of the atmosphere.

Give an account of any use which may be made of barometric readings.

[66 marks.]

3. Write down the laws of refraction of light.

Define refractive index.

Describe with the aid of a diagram how the path of a ray of light through a rectangular block of glass may be traced and how the refractive index of glass may be found.

Write down the velocity of light.

[66 marks.]

4. With reference to heat, what is meant by (i) conduction, (ii) convection, (iii) radiation ? Give an example of each of these phenomena from everyday life.

Explain the connection (*a*) between radiation and frost, (*b*) between convection and the winds.

[66 marks.]

5. Describe any experiment for measuring the velocity of sound in air.

How may it be shown experimentally that sound may be transmitted through (i) a solid, (ii) a liquid, but not through a vacuum ?

Show how a knowledge of the velocity of sound in water may be used to measure the depth of the sea.

[66 marks.]

6. What is a magnet ?
Draw a sketch showing the resultant field due to a bar-magnet when its North-seeking pole is pointing South.
Give an account of the earth's magnetism.
Describe how (i) the direction of the geographic North Pole, (ii) the direction of the magnetic North Pole, may be found.

[66 marks.]

7. Describe an electromagnet.
Draw a diagram of an electric bell and explain the working of its various parts.

[67 marks.]

8. (*a*) Describe with the aid of a clearly-labelled diagram, any cell which produces electricity. Describe briefly what happens in the cell when current is being drawn from it.

(*b*) Describe an electric light bulb and explain how it works.

[67 marks.]

9. How may it be shown by experiment that when glass is rubbed with silk (i) both the glass and the silk acquire charges of electricity, (ii) that the charge on the glass is of opposite sign to that on the silk ?
Give an account of any machine which produces electricity by friction.

[67 marks.]

10. What is (i) direct current, (ii) alternating current ?
Draw a sketch of a dynamo which produces direct current and explain how it works. Explain how it differs from a dynamo which produces alternating current.
Describe briefly how electricity is transmitted in Ireland from the generating stations to the places where it is required. Why is alternating current used ?

[67 marks.]