AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1968

SCIENCE (Syllabus E)

WEDNESDAY, 19th JUNE — Morning, 10 to 12.30

Six questions to be attempted.   Illustrate your answers wherever possible.

1. Define density.
   Describe any two methods of measuring the density of a given liquid.
   A loaded test-tube floats vertically in water with 15·2 cm. of its length beneath the surface.   How much further would the test-tube sink when placed in a liquid of density 0·8 gm. per c.c. ?
(66 marks)

2. (a) State the law of the lever.
       Given a metre rule and a known weight, describe how the weight of another object may be obtained.

   (b) Write down the value of the normal (standard) pressure of the atmosphere.
       Describe a mercury barometer and state how it is used to measure the pressure of the atmosphere.   In what respects does the aneroid barometer differ from it?
(66 marks)

3. (a) Explain, with the aid of diagrams, how the following occur:-
       (i) the seasons,   (ii) eclipses of the sun.

   (b) Outline how the following occur:- (i) hail, (ii) rain, (iii) snow.
(66 marks)

4. Distinguish between heat and temperature.
   Explain what you understand by conduction, convection and radiation, of heat.   Give an example in each case.
   Discuss (i) how a room is heated by an open fire, (ii) how a greenhouse is heated by the sun.
(66 marks)

5. What is understood by (i) magnetic field, (ii) magnetic meridian, (iii) angle of dip ?
   Draw a sketch to represent the magnetic field surrounding a bar magnet placed in the magnetic meridian with its north pole pointing south.
   Describe a dip circle and show how it may be used to measure the angle of dip.
(66 marks)

6. Describe an experiment to demonstrate that (i) sound is caused by vibration, (ii) sound cannot be transmitted through a vacuum, (iii) sound may be reflected in a manner similar to light.
   Explain how echoes are produced and give a practical application of echoes.
(66 marks)

7. How may it be demonstrated that light travels in a straight line ?
   Describe any method of measuring the velocity of light in air.   Write down the value of the velocity of light in air.
(67 marks)

8. Describe an experiment to show the magnetic effect of an electric current.
   What is an electromagnet ?
   Describe, with the aid of a diagram, an electric bell or a telephone and explain how either one of them works.
(67 marks)

9. Give a short account of each of the following:-
   (a) the production of electricity by means of (i) friction, (ii) a dry cell,
   (b) electric fuses,
   (c) electric light bulbs.

   An electric bulb is marked 60 watt, 230 volt.   What do those markings mean ?   How much would it cost to keep this bulb lighting for 100 hours if electricity cost 1·5 pence per unit (i.e. kilowatt-hour) ?
(67 marks)

10. What conditions are essential for the production of an induced current ?
    Describe, with the aid of a diagram, the working of a simple dynamo.
    Why is electricity transmitted at high voltages ?
(67 marks)