

**AN ROINN OIDEACHAIS**  
(Department of Education.)

**BRAINNSE AN MHEADHON-OIDEACHAIS**  
(Secondary Education Branch).

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**INTERMEDIATE CERTIFICATE EXAMINATION, 1941.**

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**SCIENCE (Syllabus E).**

*THURSDAY, 19th JUNE.*—AFTERNOON, 4 TO 6 P.M.

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

1. What is a lever ?

State the principle on which its action is based. Draw diagrams to show how the principle of the lever is used in the following appliances: (a) a scissors, (b) a wheel-barrow, (c) a sugar tongs. Show clearly on the diagrams (i) the position of the fulcrum, (ii) the positions and directions of the forces acting.

2. Describe, with the aid of diagrams, (a) an instrument for measuring the pressure of the air, (b) an instrument for measuring the temperature of the air, and explain how each works.

Explain how the temperature of the air at a place depends on (i) the distance of the place from the equator, (ii) its altitude, (iii) its distance from the sea.

3. What is meant by (a) conduction, (b) convection, (c) radiation ? Give one everyday example to illustrate your answer in each case.

A metal vessel containing hot water is exposed to the air. Describe how the water loses heat and how the loss of heat might be retarded.

4. State the laws of reflection of light.

Show, with the aid of diagrams, how images are formed, (a) by a plane mirror, (b) by a convex mirror. State what is observed when the image is compared with the object in each case.

Mention any appliance in which use is made of any kind of mirror and explain its working.

5. Write brief notes to explain each of the following :—

- (a) the bent appearance of an oar when one end of it is beneath the surface of the water ;
- (b) the elliptical appearance of the setting sun ;
- (c) a river appears to be shallower to a person on the bank than it really is ;
- (d) how a lens may be used to ignite a piece of paper ;
- (e) how a lens may be used to magnify small objects.

6. Describe each of the following :—(a) a simple electric cell, (b) an electric bell, and explain how they work. Show, with the aid of a diagram, how a cell, a bell and the push button are arranged in a circuit.

7. Explain how sound is produced and how it is transmitted through the air.

Write short notes to explain each of the following :—

- (a) a person can hear the noise of a distant train more clearly when he puts his ear close to the rails ;
- (b) to a person sitting in a train the noise seems to increase as the train passes underneath a bridge ;
- (c) distant sounds are heard clearly on a frosty night ;
- (d) the flash from a distant gun is seen before the sound of the explosion is heard.

8. What are shadows ?

Describe how the length of the shadow of a vertical pole varies from time to time during the day. Describe also how the length of the noonday shadow varies from time to time during the year.

What causes the variations ?

Show how the shadow of a pole may be used to determine the cardinal points.

9. Write short notes to explain the occurrence of each of the following :—(a) rain, (b) snow, (c) land and sea-breezes, (d) trade winds, (e) lightning.

10. State how electric currents may be induced in a coil of wire. What determines the direction of the induced current ?

Describe, with the aid of a diagram, an electric transformer and explain how it works. Write a brief note on its importance in electricity.