AN ROINN OIDEACHAIS
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1940.

SCIENCE (Syllabus E).

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

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

1. Explain the following :

   (i) how an airship floats in the air ;

   (ii) how a submarine floats on the surface of the sea or submerges itself according as the commander wishes.

Write down the Principle on which your answers are based.

2. Describe, with the aid of a diagram, any form of standard barometer, and explain how it works.

How may a barometer be used

   (*a*) to find the height of a mountain ?

   (*b*) to predict dry or wet weather ?

3. What is the meaning of (*a*) conduction of heat, (*b*) convection of heat.

Describe, with diagram, how a domestic hot-water system works *or* how a motor-car engine is kept cool when it is working.

4. Explain why :

   (*a*) a kettle, filled completely with water, overflows when heated ;

   (*b*) a metal spoon is sometimes put into a glass before hot water is poured in ;

   (*c*) loosely-woven clothes are warmer than tightly-woven ones ;

   (*d*) a small space is left between consecutive rails on the rail road ;

   (*e*) there is often a polished surface behind an electric fire.

5. What is meant by refraction of light ?

Mention three everyday examples of the refraction of light and explain each with the aid of a diagram.

6. Explain any method which may be used to magnetise an iron bar. Mention the chief properties of a magnet.

How does a magnetised bar of iron suspended at its centre of gravity behave when it is free to turn (*a*) in a horizontal plane, (*b*) in a vertical plane ?

7. Describe a simple dynamo, and explain how it works.

Mention three uses of an electric current.

8. Explain carefully, with the aid of diagrams,

(*a*) an eclipse of the sun,

(*b*) an eclipse of the moon.

Treat the cases of partial and total eclipse.

9. Write short notes to explain the following :

(i) the formation of (*a*) hailstones, (*b*) dew, (*c*) fog ;

(ii) why ice does not form quickly on the surface of a lake and why the water does not freeze to the bottom during hard frost ?

10. Explain how sound travels through the air.

Which is greater, the speed of light or the speed of sound ? How do you know ?

Give a brief explanation of each of the following :

(*a*) windows often rattle during thunder ;

(*b*) it is sometimes difficult to hear a lecturer clearly in a large hall although the lecturer is not to blame ;

(*c*) the rumbling sound of distant thunder.