

AN ROINN OIDEACHAIS  
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS  
(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1938.

FULL COURSE.  
SCIENCE (Syllabus A)

MONDAY, 20th JUNE.—AFTERNOON, 4 TO 6 P.M.

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

1. How would you measure:—

- (a) the diameter of a penny;
- (b) the circumference of a wooden cylinder;
- (c) the volume of one of a number of equal pellets of lead;
- (d) the volume of a goose's egg;
- (e) the area of your footprint?

2. Distinguish between density and specific gravity.

Describe an accurate method of finding the density of a liquid. If the density comes to 0.9 gm. per c.c. how would you find out the name of the liquid?

3. State:—

- (a) the Law of Floating Bodies;
- (b) the Principle of Archimedes.

Describe in detail how you would verify (a) experimentally.

4. Distinguish between heat and temperature.

Compare and contrast mercury and water as regards their suitability for use in the making of a thermometer.

5. State:—

- (a) Boyle's Law;
- (b) Charles' Law.

How may Charles' Law be verified experimentally?

6. What is "latent heat"?

Sketch the apparatus by means of which you could find the latent heat of vaporisation of water.

State briefly how you use it and what precautions you would take to secure accuracy.

7. What two types of substance neutralize one another to produce salts?

Name one substance of each kind.

Explain how with these substances you would prepare a clean neutral specimen of a salt.

Name it.

8. How would you prepare carbon dioxide in the laboratory? Sketch the apparatus you would use.

Describe the chief chemical and physical properties of the substance.

Give an example of the use of carbon dioxide either (a) in nature, or (b) in industry.

9. Explain the following terms:—

(a) chemical equivalent;

(b) solution;

(c) combustion;

(d) distillation;

(e) neutralisation.

10. Enunciate the proposition known as the Parallelogram of Forces.

How would you verify it experimentally?

If two co-planar forces of 5 lbs. and 10 lbs. act on a body at right angles to each other, find the direction and magnitude of their resultant.

11. A stick weighing 1 lb. is hung up horizontally at a point A, not its centre of gravity. It is kept horizontal by a weight  $w$  ozs. suspended at a distance  $d$  inches from A.

The following table gives the values of  $w$  and  $d$ .

$w$ ozs.	4	6	8	10	12	14	16
$d$ ins.	20	13.3	10	8	6.6	5.7	5

Draw a graph showing the relation between  $w$  and  $d$ .

What do you learn from the graph?

How far is the centre of gravity from A?

12. State the laws of friction.

How would you verify one of these experimentally?