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(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1937.

LOWER COURSE.

SCIENCE (Syllabus A).

FRIDAY, 18th 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. Distinguish between "density" and "specific gravity."

A solid (density 2.5 gm. per c.c.) weighs 20 gm. in air.

Determine the density of the liquid in which the solid would weigh 8 gm.

2. What do you understand by (a) the area, (b) the volume of an object?

A cylinder is 10 cms. long, and has a diameter of 14 mm.

Calculate (a) its total area, (b) its volume.

3. State Boyle's Law.

A little air is introduced above the mercury in a barometer.

When the atmospheric pressure is 31" the height of the mercury column is 29" and the length of the air column is 7".

Determine the atmospheric pressure when the length of the air column is 8".

4. Distinguish between:

(a) specific heat and latent heat;

(b) melting and dissolving;

(c) evaporation and boiling.

5. Describe experiments you have seen which show the presence of:

(a) water vapour in the atmosphere;

(b) dissolved air in tap-water;

(c) dissolved solids in sea-water.

Sketch the apparatus used to collect the air in (b).

6. Define "Coefficient of Linear Expansion."

An iron wheel three feet in diameter is heated through 400°C . Determine, in inches, the increase in length of the circumference.

(Coefficient of linear expansion of iron = $.000012$.)

7. One end of a poker is placed in the fire for a short time. On removal, a hand is placed :

- (a) on the other end ;
- (b) above the hot end ;
- (c) below the hot end.

Explain how the hand receives heat from the poker in each case.

8. Describe an experiment you have seen to show the burning of phosphorus in air confined over water.

What changes take place (a) in the phosphorus, (b) in the air ?

9. Explain the terms : filtration, evaporation, distillation, sublimation.

Give examples showing the practical utility in chemical operations of each of these processes.

10. Explain the following terms :

(a) element ; (b) compound ; (c) acid ; (d) alkali ; (e) salt.

Give one example in each case.

11. What do you understand by the resultant of two co-planar forces ? How is it determined ?

Two co-planar forces, 3lbs. and 4lbs. weight act at right angles to each other on a body. Determine the magnitude of their resultant.

12. A metre stick hangs horizontally from a thread and balances exactly at the 50 cm. mark.

The thread is then displaced to the 40 cm. mark, and a mass of 30 gm. has to be suspended from the 15 cm. mark to keep the stick horizontal.

Determine the weight of the stick.

State the principle on which the result is calculated.