

AN ROINN OIDEACHAIS

(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS

(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1929.

SCIENCE (Syllabus B).

WEDNESDAY, 19th JUNE.—MORNING, 10 A.M. TO 12 NOON.

[Not more than six questions to be attempted. Illustrate your answers wherever possible.]

1. How is the " Law of Constant Composition of a pure Compound " verified?

35 marks.

2. What experiments would you perform to show that plants cannot manufacture starch in the absence of carbon dioxide? Make sketches of the apparatus.

35 marks.

3. Describe how you would compare the heat capacity of iron and of water. Under similar conditions iron feels colder than wood—why?

35 marks.

4. If the height of the mercury column of a barometer is 76 cm., and the temperature is $0^{\circ}\text{C}.$, calculate the pressure of the atmosphere in grams per sq. cm. [Density of mercury at $0^{\circ}\text{C}.$ = 13.6 gm. per c.c.]

35 marks.

5. What experiments may be performed in the laboratory to show that the atmosphere contains oxygen, nitrogen, carbon dioxide and water vapour?

50 marks.

6. How is the composition of ammonia determined? What chemical changes occur during the process?

50 marks.

7. Make a labelled drawing of the parts of any seed you have dissected. Describe how you would show that seeds require air for germination.

50 marks.

8. State the principal characteristics of any rock in your school district and describe how it is being broken up by weathering and by plants.

50 marks.

9. Make a drawing to show that the wheel and axle is equivalent to a certain type of lever. If required to raise a load of 224 lbs. fifty feet by means of a wheel and axle and a power of 75 lbs., determine suitable dimensions for the wheel and axle.

50 marks.

10. Discuss the differences between (a) dew and hoar-frost, (b) cloud and water vapour, (c) boiling and evaporation, (d) saturated and unsaturated vapour.

50 marks.

11. Describe, with sketches, how you would check the accuracy of the boiling and freezing points of a thermometer. What numbers represent the fixed points on the Centigrade and Fahrenheit scales respectively?

50 marks.

12. The sides of a four sided field on the 25" Ordnance Survey map are :—AB 6.5", BC 5.65", CD 5.7", DA 3.2" and the diagonal BD is 8". Having plotted the field, determine its area in acres. (The scale of the 25" map is $\frac{1}{2500}$).

50 marks.