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(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1935.

LOWER COURSE.

SCIENCE (Syllabus A).

MONDAY, 17th 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. What is meant by "specific gravity"?

A solid weighs 5·95 gm. in air; 3·95 gm. in water and 4·25 gm. in a given liquid. Find

(*a*) the volume of the solid;

(*b*) the specific gravity of the liquid.

2. Show, using diagrams, how an enclosed quantity of air can be subjected to the following conditions:

(*a*) atmospheric pressure;

(*b*) pressure greater than atmospheric;

(*c*) pressure less than atmospheric.

3. (*a*) Describe how a simple mercury barometer is constructed.

(*b*) What happens when the barometer tube is tilted?

(*c*) How would you find if there is any air above the mercury in the tube?

4. What is meant by (*a*) calorie ;

(*b*) specific heat.

A copper calorimeter weighing 15·2 gm. contains 39·02 gm. of water at 16·1°C. A piece of copper weighing 40·59 gm. is heated to 99·6°C and placed in the water. The final temperature of the whole is 23·2°C. Calculate the specific heat of the copper.

5. Distinguish between evaporation and boiling. How can it be demonstrated that water will boil at temperatures far below 100°C if the pressure on it is reduced ?

6. Define the coefficient of linear expansion of a solid.
A brass rod is 45·91 cm. long at 15°C and 45·98 cm. at 95°C. Find the coefficient of linear expansion of brass.

7. Mention four constituents of the atmosphere. Describe their properties.

8. The elements carbon, sulphur, phosphorus and calcium are burnt in oxygen.

(*a*) Give the properties of the products formed in each case.

(*b*) State the effect of water on each product.

9. Give three examples of physical change and three examples of chemical change. Explain your choice in each case.

10. What is meant by the moment of a force about a point ?
Two men, A and B, carry a weight of ten stone on a light pole resting on their shoulders. The weight hangs from a point on the pole 3 feet from A and 4 feet from B. Find :

(*a*) the force on A's shoulder ;

(*b*) the force on B's shoulder.

11. Give a brief account of any experiments you know which demonstrate the composition of water.

12. A wire stretched between two poles, one at each side of a street, supports a lamp over the centre of the street. Is the force in the wire greater or less than the weight of the lamp ? Give reasons.