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(Department of Education.)

INTERMEDIATE CERTIFICATE EXAMINATION, 1945.

SCIENCE (Syllabus E).

TUESDAY, 19th JUNE.—MORNING, 10 TO 12.

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

1. Define mass and weight and distinguish clearly between them.
Why does the weight of an object vary at different places on the earth's surface?
Describe the type of balance which would be used to show these variations in weight and tell how the principle on which its working is based might be investigated in the laboratory.
2. What do you understand by each of the following:—force, moment of a force, law of the lever?
Give one every-day example to illustrate the working of a lever in each of the following cases:—(a) when the fulcrum is at one of its ends, (b) when the fulcrum is situated between the two ends.
In each case draw careful diagrams to show the position and direction of the forces acting on the lever, and compare their magnitudes when the lever is in equilibrium.
3. Give an account of the size, shape and movement of the moon.
Draw diagrams to explain each of the following:—
 - (a) the change in appearance of the moon during the interval between one new moon and the next one,
 - (b) the apparent movement of the moon in the sky (i) during the night (ii) during the period from new moon till full moon.
4. Explain how lightning and thunder occur.
Describe a lightning conductor and explain how it acts.
Give an account of a laboratory experiment in support of your explanation.
5. How may it be shown in the laboratory that (a) water has its greatest density at 4°C., (b) that water is a bad conductor of heat?
Explain the importance of these properties in everyday life.
6. What do you understand by reflection and refraction of light?
Draw a diagram of a rainbow, showing the relative positions of the various colours, and explain how the rainbow is formed.

7. Describe how sound is produced and how it is transmitted through a medium such as air.

How may it be shown in the laboratory that sound cannot be transmitted in a vacuum?

Explain why sounds travel further (a) with the wind than against the wind, (b) by night than by day.

8. Describe how a suitable conductor may be charged by means of friction (a) with positive electricity, (b) with negative electricity.

Explain each of the following:—

- (a) when a person is combing his hair a crackling sound is sometimes heard,
- (b) on removing the comb from the hair after each stroke strands of hair attempt to follow it,
- (c) the extremities of the hairs move away from one another after the combing.

9. What effects may be produced by the passage of an electric current through a conductor? Describe briefly one practical application of each in everyday life or in industry.

10. What are magnets and how are they made?

Give an account of their chief properties.

Describe the mariner's compass and explain how it is used.