

AN ROINN OIDEACHAIS.

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1961.

PHYSICS.—PASS.

WEDNESDAY, JUNE 14—AFTERNOON, 3 TO 5.30.

Not more than six questions to be answered.

One question, at least, must be answered from each section.

SECTION I.

1. What is meant by the "centre of gravity" of a body?

Describe a method of finding the centre of gravity of an irregularly shaped thin metal plate.

Three equal masses are placed one at each vertex of an equilateral triangle of side 2 units. Find the distance of the centre of gravity of the masses from one of the sides.

[66 marks.]

2. Define "specific gravity" of a substance.

Describe an experiment to measure the specific gravity of a given metal.

A flask weighs 50 gms. when empty and 150 gms. when filled with water. If 40 gms. of lead are placed in the empty flask and if the flask is then filled up with water, find the weight of the whole.

[Specific gravity of lead=11.]

[66 marks.]

3. Distinguish between "potential energy" and "kinetic energy".

A body weighing 10 gms. is projected vertically upwards from the ground with an initial velocity of 80 ft./sec. Find (i) the greatest height to which it rises, (ii) the time it takes to return to the ground. Find, also, in ft./lbs. (iii) the potential energy, (iv) the total energy of the body when it is 50 ft. above the ground.

[67 marks.]

SECTION II.

4. What is meant by the "mechanical equivalent" of heat?

Describe an experiment to measure the mechanical equivalent of heat.

[66 marks.]

5. State the laws of reflection of light and describe how to test one of them by experiment.

A pin standing erect is moved from a great distance along the axis of a concave mirror towards the pole. Describe with the aid of a diagram the position and nature of the image when the pin is (a) far away, (b) at the centre of curvature, (c) between the focus and the pole.

[66 marks.]

6. Describe a method of measuring

(a) the focal length of a convex lens,

(b) the index of refraction of water.

[67 marks.]

SECTION III.

7. Explain the term "neutral point" in a magnetic field.

A bar magnet is placed in the magnetic meridian and with its north pole pointing South. Explain how you would plot the resultant magnetic field. Show by means of a diagram what result you would expect and indicate the position of the neutral points.

[66 marks.]

8. Give an account of the gold-leaf electroscope and illustrate your answer by means of a diagram.

Describe fully how you would find the nature of the charge on a given conductor using the gold-leaf electroscope.

[66 marks.]

9. Describe the tangent galvanometer.

Explain how the tangent galvanometer may be used to compare the strength of two electric currents.

[67 marks.]

10. (i) Describe experiments, one in each case, to demonstrate (a) the magnetic effect of an electric current, (b) the effect of passing an electric current through acidulated water.

(ii) An electric bulb is connected to a 210 volt supply. If the bulb is working at 70 watts, find the current through the bulb and the resistance of the filament of the bulb.

[67 marks.]