

AN ROINN OIDEACHAIS.

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1960.

PHYSICS.—PASS.

WEDNESDAY, JUNE 15—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. State the law of moments and describe an experiment to test it. A uniform metre stick weighs 50 gms. Masses of 10 gms., 20 gms. and 30 gms. are suspended by means of thread at the marks 0 cms., 25 cms. and 100 cms., respectively. At what distance from its centre should the metre stick be suspended to maintain equilibrium?

[66 marks.]

2. State the law of the parallelogram of forces and describe an experiment to test it.

A force of 2 lbs. wt. acts along the straight line OX and a force of 1 lb. wt. acts along the straight line OY. If $\angle XOY = 60^\circ$, find the magnitude of the resultant force.

If this resultant force were to act on a mass of one pound, what would be the acceleration?

[66 marks.]

3. A stone weighing 1 oz. is thrown vertically upwards from the ground with an initial velocity of 80 feet per second. Calculate (i) the greatest height to which it rises, (ii) its velocity after 2 secs., (iii) its kinetic energy after 2 secs., (iv) its total energy after 2 secs. [State the units in which you calculated (iii) and (iv).]

[67 marks.]

SECTION II.

4. Show by means of a diagram how a concave mirror forms (a) a real image, (b) a virtual image.

Describe an experiment to measure the focal length of a given concave mirror.

What is meant by magnification in the case of a concave mirror?

[66 marks.]

5. State the laws of refraction of light.

Describe an experiment to measure the refractive index of the glass of a given rectangular glass slab.

Taking the critical angle of a certain kind of glass to be 42° , calculate the refractive index.

[66 marks.]

6. (a) Describe an experiment to measure the latent heat of fusion of ice.

Calculate the heat required to convert 200 gms. of dry ice at 0°C . into steam at 100°C .

[Latent heat of fusion of ice = 80 cal./gm. ; latent heat of steam = 536 cal./gm.]

(b) What is meant by the mechanical equivalent of heat?

[67 marks.]

SECTION III.

7. In connection with the earth's magnetism, explain the following terms: magnetic meridian, declination, magnetic dip.

Describe fully an experiment to measure the declination at a given place.

[66 marks.]

8. A deep tin can stands on the cap of a gold-leaf electroscope and an insulated ball with a positive charge is lowered into the can, so that the ball (i) does not touch, (ii) touches, the inside of the can. In each case give an account of the distribution and nature of the resulting charges on the can and on the electroscope and illustrate your answer by means of diagrams.

[66 marks.]

9. (a) Describe a method of measuring the resistance of a given piece of wire.

(b) How many different resistances can be obtained using three 2-ohm resistances all at the same time? Find the total resistance in each case.

[67 marks.]

10. Write a note on the effect of passing a direct current of electricity through a solution of copper-sulphate using copper electrodes.

Define *electro-chemical equivalent* of an element.

Describe how to measure the electro-chemical equivalent of copper.

[67 marks.]