

AN ROINN OIDEACHAIS.

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1958.

PHYSICS.—PASS.

Monday, June 16—Morning 10—12.30

Not more than six questions to be answered.

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

SECTION I.

1. When a car, starting from rest and travelling with uniform acceleration, has gone a distance of 220 yards its speed is 30 m.p.h. Find the acceleration and, also, the time taken to reach this speed of 30 m.p.h.

If the car weighs 2,000 lb., what is its kinetic energy when it is travelling at 30 m.p.h. ?

[66 marks.]

2. State the Principle of Archimedes and describe an experiment to demonstrate it.

A body weighing 100 grams and of specific gravity 0.8 is put into water. What is the volume of the part of the body above the water ? What is the least force which will keep the whole body submerged in water ?

[66 marks.]

3. Describe an experiment to locate the centre of gravity of a lamina of irregular shape.

Prove that the centre of gravity of a triangular lamina is at the point of intersection of the medians.

[67 marks.]

SECTION II.

4. State Boyle's law and also Charles' law. Describe an experiment to test Charles' law.

A given mass of gas at 27°C. and under a pressure of 90 cms. of mercury occupies 1,000 c.c. Calculate the volume at N.T.P.

[66 marks.]

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

A luminous point on the axis of a concave mirror of focal length 10 cms. is half-way between the focus and the centre of curvature of the mirror. Find the position of the image and illustrate your answer by means of a diagram.

[66 marks.]

6. Define index of refraction of a medium. Describe an experiment to measure the index of refraction of glass, given a rectangular block of glass.

Taking the index of refraction of glass to be $\frac{3}{2}$, construct an accurate diagram to show the path of a ray of light emerging from glass to air.

[67 marks.]

SECTION III.

7. What do you understand by the electro-chemical equivalent of an element?

Describe an experiment to measure the electro-chemical equivalent of copper.

Knowing the electro-chemical equivalent of a metal describe, in brief, how to test the accuracy of a given ammeter.

[66 marks.]

8. What is meant by (a) the horizontal component of the earth's magnetic field, (b) magnetic meridian?

Using a bar magnet of known magnetic moment describe a method of measuring the horizontal component of the earth's magnetic field.

[66 marks.]

9. Describe the Leyden jar condenser. What is meant by the capacity of the condenser? What does its capacity depend on?

Describe an experiment to show that as the charge on the condenser is increased its potential also increases.

[67 marks.]

10. Describe *three* experiments carried out by Faraday on electromagnetic induction.

What can be deduced from these experiments?

[67 marks.]