

# AN ROINN OIDEACHAIS.

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1953.

## PHYSICS.—PASS.

FRIDAY, 19th JUNE.—MORNING 10 TO 12.

Not more than six questions to be answered.

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

### SECTION I.

1. Define (i) specific heat, (ii) latent heat of steam. Describe fully how to find by experiment the latent heat of steam.

[66 marks.]

2. A body of mass 20 lbs. falls freely from rest at a point A, 100 feet above the ground.

Calculate the velocity of the body just before it hits the ground and, also, the time it takes the body to fall. What is the potential energy of the body at A? What is the greatest kinetic energy of the body?

[66 marks.]

3. An engine of mass 50 tons pulls a train of mass 150 tons along a horizontal track at a steady speed of 60 miles per hour. If the resistance against the motion of the train and its engine is 10 lb. weight per ton, at what horse power is the engine working? [One horse power=550 foot lb. per sec.]

[67 marks.]

### SECTION II.

4. (a) Describe experiments, one in each case, to show

(i) that light travels in straight lines,

(ii) that at a plane reflecting surface the angle of incidence of a ray of light is equal to the angle of reflection.

(b) Describe a pin-hole camera, and explain how an image of an object is formed in it. In what way would the image be altered if (i) the distance of the object from the camera and (ii) the size of the hole, were altered? Give reasons for your answer to (i) and (ii).

[66 marks.]



5. Describe a method for measuring the focal length of a convex lens.

Indicate by means of a diagram how a convex lens may be used as a magnifying glass.

[66 marks.]

6. Explain (i) refractive index, (ii) critical angle, of a medium.

Describe how the refractive index of a transparent medium may be found by experiment.

Show that for a transparent medium  $\mu = \frac{1}{\sin a}$ , where  $\mu$  is the index of refraction of the medium and  $a$  is its critical angle.

[67 marks.]

### SECTION III.

7. What is meant by "dip"?

Describe the dip circle and tell how you would use it to measure the dip.

Give a general account of the variations in the dip over the earth's surface. How may these variations be explained?

[66 marks.]

8. Describe the gold-leaf electroscope and mention the purposes for which it is used.

Describe how a gold-leaf electroscope may be charged positively by induction.

[66 marks.]

9. Name and define the practical unit of (i) current, (ii) resistance, (iii) potential difference.

How are they related to one another?

When a current is passed through a wire of resistance  $\frac{1}{10}$  ohm, the potential difference between the ends of the wire is 1.4 volts. What is the strength of the current?

[67 marks.]

10. Describe a simple form of potentiometer.

Describe, also, how you would use the potentiometer to compare the electromotive forces of two cells.

[67 marks.]