

LEAVING CERTIFICATE EXAMINATION, 1962.

PHYSICS — PASS.

THURSDAY, 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. State Boyle's Law and describe an experiment to illustrate the truth of the law. Calculate the density of the air at a pressure of 80 cms. of mercury and at $0^{\circ}\text{C}.$, given that the density at N.T.P. is 1.29×10^{-3} gm./c.c. (66 marks.)
2. Define (i) acceleration, (ii) force. Distinguish between mass and weight. Four forces act at a point as follows: 15 lbs. wt. due North, 24 lbs. wt. due East, 21 lbs. wt. due South, and 16 lbs. wt. due West. Find the magnitude and direction of the resultant. (66 marks.)
3. A body is projected vertically upwards from the ground with an initial velocity of 200 ft. per second. Find (i) its velocity after 3 seconds, (ii) the greatest height to which it rises, (iii) the time it takes to reach its greatest height. If the mass of the body is 2 lbs., what is its energy in foot-pounds just before it hits the ground? (67 marks.)

SECTION II.

4. What do you understand by (i) specific heat, (ii) water equivalent of a calorimeter? Describe an experiment to find the specific heat of a given metal. A calorimeter, of water equivalent 5 gm., contains 51 gm. of water at $30^{\circ}\text{C}.$, and 4 gm. of ice at $0^{\circ}\text{C}.$ are added to the water. Calculate the temperature of the water when all the ice has melted, assuming that no heat is lost to the air. [Latent heat of fusion of ice = 80 calories/gm.] (66 marks.)
5. State the laws of reflection of light and describe an experiment to illustrate any one of them. Describe with the aid of a diagram how a concave mirror forms (i) a real image (ii) a virtual image. The focal length of a concave mirror is 10 cm. If an object is placed on the axis of the mirror halfway between the focus and the centre of curvature of the mirror, find the position and the nature of the image. (66 marks.)
6. Describe an experiment to find the focal length of a given convex lens. Given a choice of lenses, describe how, using two of them, you would set up a simple telescope. Show by means of a ray-diagram how the final image is formed. (67 marks.)

SECTION III.

7. State what you understand by (i) a magnetic field, (ii) the poles of a magnet, (iii) magnetic dip, (iv) declination. Describe fully how you would measure the angle of magnetic dip at a given place. (66 marks.)
8. Describe a machine which produces electricity by friction and explain how it works. Explain how you would test the nature of the charge on a charged electroscope. (66 marks.)
9. Describe, with the aid of a labelled diagram, a Daniell cell or a Leclanché cell. Give an account of an experiment to find the internal resistance of a cell. (67 marks.)
10. What do you understand by the following terms:- electrolysis, electrolyte, anode, cathode? Describe, with the aid of a diagram, an experiment to find the electro-chemical equivalent of copper. (67 marks.)