

## LEAVING CERTIFICATE EXAMINATION, 1969

## PHYSICS - PASS

Six questions to be answered.

1. What is meant by saying that velocity is a vector quantity? Could a particle travelling in a circle have uniform velocity? Explain your answer.  
A car, starting from rest, moves with uniform acceleration. If it covers the first 100 yards in 6 seconds, how long will it take to cover the second 100 yards?  
(66 marks)
2. (a) Given the kinetic theory equation  $p = \frac{1}{3} n m \bar{c}^2$  (where  $p$  = pressure of the gas,  $n$  = number of molecules per unit volume of the gas,  $m$  = mass of a molecule,  $\bar{c}^2$  = mean-square velocity of the molecules) deduce any one of the gas laws from it.  
(b) Describe an experiment to measure the mechanical equivalent of heat.  
(66 marks)
3. Show by means of ray-diagrams the formation of a real image by means of (i) a concave mirror, (ii) a convex lens.  
Outline a method of measuring the focal length of a convex lens.  
An object is placed vertically on the principal axis of a convex lens of focal length 12 cm. A real image three times the size of the object is formed. Calculate the position of the object.  
(66 marks)
4. Describe any experiment which demonstrates light as a wave phenomenon.  
What is meant by (i) interference, (ii) diffraction, of light waves?  
Give an account of an experiment to measure the wavelength of monochromatic light.  
(66 marks)
5. Describe an X-ray tube and give the principal properties of X-rays.  
Explain the term electromagnetic radiation. Name any electromagnetic radiation other than X-rays and show its position relative to X-rays in the electromagnetic spectrum.  
(66 marks)
6. What are electrons, protons, neutrons?  
Outline any two methods by which a beam of electrons may be obtained.  
State briefly how the neutron was discovered. Why has the neutron proved such a useful particle in the production of radioactive isotopes?  
(66 marks)
7. Give an account of an experiment to show that a force is exerted on a current-carrying conductor in a magnetic field.  
Describe a moving-coil milliammeter and show how it may be converted into a voltmeter.  
(67 marks)
8. What is the relation between the ampere (amp), the volt and the ohm?  
Describe experiments, one in each case, (i) to measure the resistance of a piece of wire, (ii) to measure the internal resistance of a cell.  
(67 marks)
9. Explain the terms ion, electrolyte, electrode.  
State Faraday's laws of electrolysis.  
Describe how you would check the accuracy of a given ammeter by electrolysis or otherwise.  
(67 marks)
10. Write brief notes on any two of the following:  
(a) the earth's magnetism,  
(b) the principle of an electroscope and its applications,  
(c) the nature of sound,  
(d) the generation of alternating current.  
(67 marks)