

Int. MSc-4th
Modern Physics

Full Marks : 70

Time : 3 hours

Answer six questions including Q. No. 1

The figures in the right-hand margin indicate marks

1. Answer the following questions : 2 × 10
- (i) Determine the shortest wavelength of the Lyman series of Hydrogen atom. (Rydberg constant $R = 1.097 \times 10^7 \text{ m}^{-1}$).
 - (ii) What voltage must be applied to an electron microscope to produce electrons of wavelength 0.40 \AA ?
 - (iii) The uncertainty in the location of a particle is equal to its de-Broglie wavelength. Show that the uncertainty in its velocity is equal to its velocity.
 - (iv) Calculate the wavelength associated with an electron subjected to a potential difference of 1.25 kV.