

(Set-1)

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 .

(Turn Over)