

Total Pages—3

(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  $0.40 \text{ \AA}$ ?

(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 )