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Y—112—2019

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) (Backlog) EXAMINATION

NOVEMBER/DECEMBER, 2019

(CGPA Pattern)

PHYSICS

Paper XII (PHY-302)

(Quantum Mechanics)

(Friday, 20-12-2019)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

- N.B. :—*
- (i) All questions are compulsory.
 - (ii) Figures to the right indicate full marks.
 - (iii) All symbols carry their usual meanings.
 - (iv) Given Data : $h = 6.63 \times 10^{-34} \text{ J}^{\text{s}}$, $m = 9.1 \times 10^{-31} \text{ kg}$.

1. Attempt any *four* : 8
 - (a) Calculate de-Broglie wavelength of electron when it is accelerated through potential difference of 80v.
 - (b) Write Schrödinger's equation in time independent form.
 - (c) State uncertainty principle and one of its applications.
 - (d) Write an equation for energy of an Harmonic Oscillator.
 - (e) What is orbital quantum number ?
 - (f) State Schrödinger's equation for the Hydrogen atom in spherical polar co-ordinates.
2. Attempt any *two* : 8
 - (a) On the basis of uncertainty principle show that electrons can not find the place in nucleus.
 - (b) Derive Schrödinger's equation in steady state form.
 - (c) Explain experimental demonstration of compton effect.

P.T.O.

