VIT UNIVERSITY
(Estd. u/s 3 of UGC Act 1956)
VELLORE ■ CHENNAI
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Reg. No. :

Name:

Date of exam:

Continuous Assessment Test -I, August 2016

Programme	:	**B. Tech**	Semester	:	**Fall 2016-17**
Course Title	:	**Engineering Physics**	Course Code	:	**PHY1001**
School	:	**School of Advanced Sciences – Department of Physics**	Slot	:	**C2+TC2**
Duration	:	**1 Hour 30 minutes**	Max. Marks	:	**50**

Answer all questions (5x10 = 50)

1. Describe in detail the Davisson and Germer experiment for the confirmation of the de-Broglie hypothesis. (10)

2. a) Compare the following two cases and hence provide proper interpretation. (i) An electron has a speed of 300 m/sec, accurate to 0.01%. With what fundamental accuracy we can locate the position of the electron? (ii) A bullet of mass 50 g, has a speed of 300 m/sec, accurate to 0.01%. With what fundamental accuracy we can locate the position of the bullet? (5)

b) X- Rays of wavelength 0.24 nm are Compton scattered and the scattered beam is observed at an angle of 60° relative to the incident beam. Determine (i) the wavelength of the scatted X rays (ii) the energy of the scattered X ray photons (iii) the kinetic energy of the scattered electrons. (5)

3. Derive the eigenvalues and normalized eigen functions and hence draw the probability densities of a free particle confined in a one dimensional infinite potential well of width *L*. (10)

4. a) Explain the working principle of STM with neat diagram. (5)

b) Discuss the reasons for difference in properties between bulk and nano materials. (5)

5. a) Explain quantum confinement. Mention the characteristics of quantum well, quantum wire and quantum dot. (5)

b) Briefly explain Carbon nano tubes. (5)