VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test (CAT - I), November 2022

Programme	:	B.Tech	Semester	:	FALL 2022-23
Course Title	:	Engineering Physics	Course Code	:	PHY1701
School	:	School of Advanced Sciences	Slot	:	D1+TD1
Duration	:	90 mins	Max. Marks	:	50
Class No	:	VL2022230107707			

Part – A (5 x 10 = 50)

Answer ALL Questions

Sl. No	Questions	Max Marks
1	Describe the ultraviolet catastrophe situation in the Black body radiation spectrum (5 Marks). How Planck's hypothesis solves ultraviolet catastrophe. (5 Marks)	10
2	a) Calculate the de-Broglie wavelength of an electron accelerated through 2 kV of potential difference (5 marks). b) Describe the experimental set-up for the Davisson-Germer experiment. (5 marks)	10
3	a) Describe the criteria for a given function to be well-behaved wavefunctions. (5 marks) b) Illustrate the physical significance of uncertainty principles (5 marks)	10
4	a) Given an electron trapped in an infinite potential well of width 10 nm, calculate the energy of the second excited state (5 marks) b) Sketch the ground state, first excited state, and second excited wave functions of a particle trapped in a finite potential well (5 Marks).	10
5	Derive the expression for a wave function of a particle trapped in an infinite potential well. (10 Marks)	10