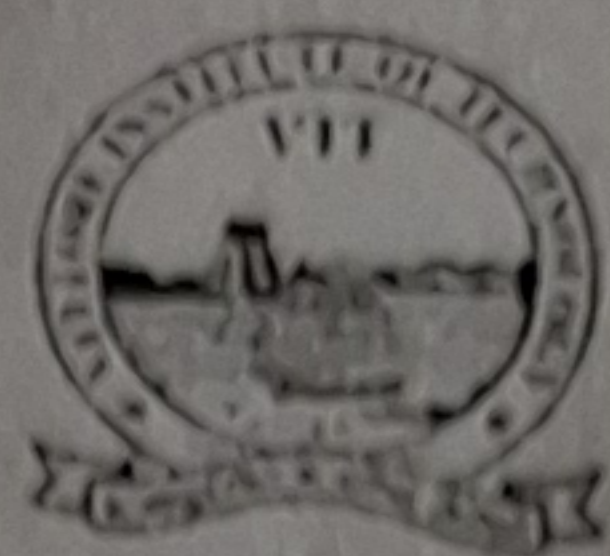




VIT

Vellore Institute of Technology
(Approved to be a University under section 3 of UGC Act, 1956)

REG.NO.: 25MIS0427

SLOT: B2+TB2

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

Programme Name & Branch	: M.Tech. (Integrated) - Software Engineering	
Course Code and Course Name	: IAPHY101 & Engineering Physics	
Faculty Name(s)	: Ramesh Babu P, Senthilnathan K & Rajan Babu D	
Class Number(s)	: VL2025260105465, 5468 & 5472	
Date of Examination	: 18/08/2025	
Exam Duration	: 90 minutes	Maximum Marks: 50

General instruction(s):

- Answer All Questions
 - M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes:
- CO1. Explain wave-particle duality by applying basic quantum principles.
- CO2. Apply quantum mechanical ideas to microscopic systems.

Q. No	Question	M	CO	BL
1.	What is Compton effect? Derive Compton scattering formula. How does Compton effect form evidence for the particle nature of electromagnetic radiation?	10	1	2
2.	a) What is <i>ultraviolet catastrophe</i> ? Prove that Planck radiation formula reduces to Rayleigh-Jeans law at low frequency regime.	5	1	3
	b) Get an expression for the de Broglie wavelength associated with an electron that is accelerated through a potential difference of 'V' volt. What would be the de Broglie wavelength of that electron in case it is subject to an accelerating potential of 64 volt?	5		
3.	What does Schroedinger equation describe? Obtain Schroedinger time dependent and independent equations.	10	1	2
4.	Assume a particle has been placed in a one-dimensional, infinite potential well of finite width. Obtain the expressions for its eigenvalue and eigenfunction. Sketch the wavefunctions and probability densities of the first three states in the one-dimensional infinite potential energy well.	10	2	2
5.	a) Compute the energy difference between the ground state and the second excited state of an electron confined to a one-dimensional, infinite potential well of width, $1 \text{ \AA}$.	5	2	3
	b) Explain the two primary reasons that turn out to be root cause for the strange behaviour associated nanomaterials.	5		