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 2022-2023**
Course Title	:	**Engineering Physics**	Course Code	:	**BPHY101L**
School	:	**School of Advanced Sciences**	Slot	:	**E1+TE1**
Duration	:	**90 mins**	Max. Marks	:	**50**
Class No	:	**5879, 5830, 5771, 5801, 5765, 5852, 5868, 5875, 5815**			

Part – A (5 x 10 = 50)

Answer ALL Questions

Sl. No	Questions	Max Marks	CO	BL
1	Write the expression for reflection and transmission coefficient for the transverse wave on a string when there is a sudden change in the impedance at the boundary. Define and write the properties of waves with relevant figure.	10	CO1	L4
2	Describe the normal modes of a standing wave on a stretched string and get the expression for their eigenfrequencies. Draw the first four normal modes for these standing waves.	10	CO1	L5
3	(a) Distinguish between progressive and standing waves. (b) The fundamental frequency of 3.5 m long stretched wire is 245 Hz. Find the wave velocity of the transverse wave generated in this wire.	5 5	CO1	L6
4	Write down Maxwell's equations in differential form for free space. Derive the electromagnetic wave equation for free space for both electric and magnetic fields from Maxwell's equations.	10	CO1	L4
5	(a) Briefly describe Hertz experiment for generation and detection of electromagnetic waves. (b) Show that the divergence of curl of a vector is zero $\vec{\nabla} \cdot (\vec{\nabla} \times \vec{v}) = 0$.	5 5	CO1	L5