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Odd Semester Examination 2024

Paper Name: Applied Physics **Paper Code: BTCSE-AI-101/BTECE-101**
Time: 2.5 Hours **Maximum Marks: 60**

Section A

Attempt ALL Questions **(4 × 5 = 20)**

Q.No.	Questions	CO	BL
1	Define periodic motion, oscillatory motion, amplitude, time period and frequency.	1	1
2	Explain the phenomenon of tunnelling in quantum mechanics that occurs when a beam of particles are incident on a potential barrier of finite width.	3	2
3	Write briefly about the properties of laser.	5	2
4	Explain Huygen's principle with the help of diagram.	4	2

Section B

Attempt any FOUR Questions **(4 × 10 = 40)**

Q.No.	Questions	CO	BL
1	Discuss the inconsistency in Ampere's law. How did Maxwell modify it?	2	4
2	(i) Derive the expression for the fringe width, β in Young's double slit experiment. (6 marks) (ii) In Young's double slit experiment, the slits are separated by a distance, $d = 0.6$ mm and the screen is placed 60 cm away. If the fringe width, $\beta = 0.06$ cm, find the wavelength of light used in the experiment. (4 marks)	4	4
3	Starting with Maxwell's equation in free space, find the electromagnetic wave propagation equation and determine the velocity of propagation.	2	4
4	Apply the time-independent Schrodinger equation for a particle trapped in a one-dimensional box of length *L*. Find the energy eigenvalues and eigen functions.	3	4
5	Explain the construction and working of ruby laser with the help of diagrams.	5	2
6	(i) Derive the expression for position as a function of time for a simple harmonic motion. (5 marks) (ii) Find the expression for total mechanical energy of SHM. (5 marks)	1	4

BL: Bloom's Taxonomy Level (1-Remembering, 2-Understanding, 3-Applying, 4- Analysing, 5-Evaluating, 6- Creating).