PRN:		Course Code:	U01BS002

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F.Y. **B.Tech**. End Semester Examination Summer 2024

Applied Physics

Day and Date: Mon E 2 DEC 2024 Max Marks: **50**

Time : 02:00PM To 04:00PM Duration: **02** hrs

Instructions:

- All questions are ***compulsory***
- *Draw **neat labeled** diagram where necessary*
- Figures to the ***right*** shows ***full marks***
- ***Digital gadgets*** are ***not allowed***

Q.1	**Attempt the following**	Marks	Bloom's Level	CO
a)	Define coefficient of absorption. How it affects reverberation?	**02**	L2	CO1
b)	State the differences between Fresnel and Fraunhofer diffraction.	**02**	L1	CO2
c)	Draw the diagram for propagation of light through optical fiber cable.	**02**	L3	CO2
d)	Write s short note on matter wave.	**02**	L1	CO3
e)	Draw structure of HCP crystal. Interpret its atomic packing fraction.	**02**	L2	CO4
Q.2	**Attempt any two from the following**			
a)	Derive Sabine's formula for reverberation time.	**05**	L4	CO1
b)	Explain construction and working of Piezoelectric oscillator.	**05**	L3	CO1
c)	The volume of a hall is 12,000 cu. ft. and its total absorption equals 1000 sq. ft. Entry of people in the hall raises the absorption by 2000 sq. ft. Determine change in the reverberation time.	**05**	L3	CO1

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Q.3	**Attempt any two from the following**				
	a)	What is interference? Discuss its types.	**05**	L2	CO2
	b)	State the applications of Infrared and Radio waves.	**05**	L2	CO2
	c)	Define polarization. Explain any two methods to produce polarized light.	**05**	L2	CO2
Q.4	**Attempt any two from the following**				
	a)	Discuss the applications of laser.	**05**	L3	CO2
	b)	What is stimulated emission? Explain the components of laser.	**05**	L1	CO2
	c)	State the types of magnetic materials. Explain differences between them.	**05**	L2	CO4
Q.5	**Attempt any two from the following**				
	a)	Derive the equation of de-Broglie wavelength ($\lambda=h/p$). Calculate the wavelength associated with the moving electron with the velocity 2 X 10^6 ms^{-1}. (Given, Mass of electron m $=9.1\times10^{-31}$ Kg; Planck's Constant, h = 6.62607015×10^{-34} J-s)	**05**	L4	CO3
	b)	State and explain the for Compton effect.	**05**	L4	CO3
	c)	Derive the Bragg's law for X-ray diffraction grating.	**05**	L4	CO4

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