

**PRAGATI ENGINEERING COLLEGE: SURAMPALEM**  
(AUTONOMOUS)  
**I B.Tech I Semester Supplementary Examinations, July – 2024**

**APPLIED PHYSICS**  
(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

Answer ONE Question from each Unit  
All Questions Carry Equal Marks

Q. No.	Questions	BTL	CO	Marks
<b>UNIT – I</b>				
1.	a) Explain the principle of Superposition of waves	K2	CO1	7M
	b) Describe the formation of Newton's rings and derive an expression for the wavelength of the light used	K1	CO1	7M
<b>OR</b>				
2.	a) Discuss the Fraunhofer Diffraction due to a double slit	K2	CO1	8M
	b) A grating has 5 cm of surface, ruled with 6000 lines/cm. What is the resolving power of the grating in the first order	K3	CO1	6M
<b>UNIT – II</b>				
3.	a) Describe the construction and working of a Helium- Neon Laser	K2	CO2	10M
	b) Write any four applications of Lasers	K1	CO2	4M
<b>OR</b>				
4.	a) Explain the principle of an Optical fiber with neat diagrams	K2	CO2	7M
	b) Calculate the numerical aperture and acceptance angle for an optical fiber with core and cladding refractive indices being 1.48 and 1.45 respectively	K3	CO2	7M
<b>UNIT – III</b>				
5.	a) Compare and contrast the properties of Dia, Para and Fero magnetic materials	K2	CO3	10M
	b) Differentiate Hard and Soft magnetic materials	K2	CO3	4M
<b>OR</b>				
6.	a) Derive Clausius-Mosotti relation in dielectrics subjected to static fields	K3	CO3	7M
	b) A parallel plate capacitor has an area of 100 cm <sup>2</sup> , a plate separation of 1 cm and is charged to a potential of 100 volts. Calculate the capacitance of the capacitor and the charge on the plates.	K3	CO3	7M
<b>UNIT – IV</b>				
7.	a) Derive Schrodinger's time independent wave equation	K3	CO4	7M
	b) An electron is confined to a one dimensional potential box of length 2 Å. Calculate the energies corresponding to the second and fourth quantum states in eV.	K3	CO4	7M
<b>OR</b>				
8.	a) Write the important postulates of Classical free electron theory	K1	CO4	7M
	b) Derive an expression for the density of states.	K3	CO4	7M
<b>UNIT – V</b>				
9.	a) Discuss the formation of allowed and forbidden energy bands on the basis of the Kronig- Penney model	K2	CO5	10M
	b) Bring out the differences among the conductors, Insulators and Semiconductors	K2	CO5	4M
<b>OR</b>				
10.	a) Differentiate Drift and Diffusion currents in semiconductors	K2	CO5	7M
	b) Explain the formation of an n- type semiconductor	K2	CO5	7M