PVP 23

Code: 23BS1103

I B.Tech - I Semester – Supplementary Examinations – MAY 2025

ENGINEERING PHYSICS

(Common for CE, ME, IT, AIML, DS)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

PART – A

1.a)	Explain Population Inversion and Pumping.
1.b)	List out the Applications of Optical fibers.
1.c)	Interpret Space lattice and Basis.
1.d)	Mention the lattice parameters of Hexagonal crystal structure.
1.e)	Outline Electronic Polarisation.
1.f)	Illustrate Magnetic Susceptibility and Permeability.
1.g)	Analyse Concept of Dual nature of matter.
1.h)	Write a relation for Electrical Conductivity.
1.i)	Identify Acceptor energy level in P type Semiconductors.
1.j)	Define Diffusion current.

PART – B

					Max. Marks
UNIT-I					
2	a)	Explain construction and working of RUBY LASER.			6 M
	b)	List out Applications of LASER.			4 M
OR					
3	a)	Illustrate Numerical Aperture and Acceptance Angle.			6 M
	b)	Calculate Acceptance angle, if light is launched in to fiber through air with core refractive index 1.60 and cladding refractive index 1.50.			4 M
UNIT-II					
4	a)	Interpret atomic packing Fraction in BCC Crystal Structure.			5 M
	b)	Mention Seven crystal systems and their lattice parameters.			5 M
OR					
5	a)	Discuss Powder Diffraction Method for determination of crystal Structure.			6 M
	b)	Describe Bragg's law.			4 M
UNIT-III					
6	a)	Interpret Clausius Mossotti Equation.			4 M
	b)	Derive Lorentz Internal field of a Dielectric material.			6 M
OR					

7	a)	Illustrate Domain concept for Ferro magnetic materials.	4 M
	b)	Explain about dia Magnetic and Ferro magnetic Materials.	6 M
		UNIT-IV	
8	a)	Explain Significance of wave function and Derive Schrodinger's Time dependent wave Equation.	6 M
	b)	Calculate Energy of an electron in First Excited state and second Excited state when electron is bound in 1-D Infinite well of width 10^{-30} m.	4 M
		OR	
9	a)	Derive Electrical conductivity based on Quantum free Electron Theory.	6 M
	b)	Illustrate about Density of Energy states.	4 M
		UNIT-V	
10	a)	Distinguish between P-Type and N-Type Semiconductors.	4 M
	b)	Calculate Electron Carrier Concentration in Intrinsic Semiconductors.	6 M
		OR	
11	a)	Calculate Carrier Concentration in N-type extrinsic Semiconductors.	6 M
	b)	Explain Fermi Energy Level diagrams in Extrinsic Semicondutors.	4 M