PVP 23

Code: 23BS1203

I B.Tech - II Semester – Regular / Supplementary Examinations
JUNE 2026

ENGINEERING PHYSICS
(Common for EEE, ECE, CSE)

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.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	Distinguish between Spontaneous and Stimulated emission.	L4	CO4
1.b)	Discuss the structure of an optical fiber.	L3	CO2
1.c)	Explain the term “Coordination number”.	L4	CO5
1.d)	What is packing fraction?	L2	CO1
1.e)	Define Displacement vector (D).	L2	CO1
1.f)	What is Magnetic permeability?	L3	CO3
1.g)	Interpret Heisenberg’s Uncertainty Principle. Why can’t we measure both simultaneously with absolute precision?	L4	CO5
1.h)	Write the physical interpretation of wave function ‘Ψ’ .	L3	CO3
1.i)	Why is a semiconductor act as an insulator at 0 K?	L4	CO4
1.j)	What are intrinsic and extrinsic semiconductors?	L3	CO2

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Choose any four applications of LASERS in various fields.	L3	CO2	4 M
	b)	Explain the construction of He-Ne Laser, and its lasing action with the help of energy level diagram.	L4	CO4	6 M
OR					
3	a)	Classify the different types of optical fibers.	L4	CO4	4 M
	b)	Interpret the expressions for the Acceptance Angle and Numerical Aperture of an optical fiber.	L3	CO2	6 M
UNIT-II					
4	a)	Discuss Crystal lattice, Bravia's lattice and primitive cell.	L3	CO3	3 M
	b)	Sketch the crystal systems with neat diagram.	L3	CO3	7 M
OR					
5	a)	Explain Bragg's law.	L4	CO5	4 M
	b)	Analyze Laue's method to determine crystal structure.	L4	CO5	6 M
UNIT-III					
6	a)	Illustrate various types of polarization mechanisms in dielectrics.	L3	CO3	4 M

	b)	Discuss Frequency dependence of polarization mechanisms.	L3	CO3	6 M
OR					
7	a)	Explain Hysteresis curve in magnetism.	L4	CO5	4 M
	b)	Analyze domain concept for Ferro magnetism & Domain walls, what are anti ferro and ferri magnetic materials.	L4	CO5	6 M
UNIT-IV					
8	a)	Elaborate De-Broglie's hypothesis of matter waves.	L3	CO3	2 M
	b)	Estimate the energy eigen values of a Particle in a one-dimensional infinite potential well using Schrodinger's wave equation.	L3	CO3	8 M
OR					
9	a)	Compare and contrast classical free electron theory with quantum free electron theory.	L4	CO5	4 M
	b)	Explain the Fermi-Dirac distribution function and its significance in understanding electron occupancy at different energy levels and temperatures.	L4	CO5	6 M
UNIT-V					
10	a)	Explain the formation of energy bands in solids. Based on this, provide a detailed classification of crystalline solids into conductors, semiconductors, and insulators with neat energy band diagrams.	L4	CO4	6 M

	b)	Discuss the dependence of Fermi energy on carrier concentration and temperature.	L4	CO4	4 M
OR					
11	a)	What is the Hall Effect? Obtain an expression for the Hall Coefficient, and the Hall Voltage.	L3	CO2	6 M
	b)	List the major applications of the Hall effect.	L3	CO2	4 M