Code: 23BS1203

I B.Tech - II Semester – Regular Examinations - JULY 2024

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)	Mention the characteristics of a laser.	L1	CO2
b)	Define Total Internal Reflection.	L1	CO1
c)	Define packing fraction.	L1	CO1
d)	Discuss any two applications of X-ray diffraction.	L2	CO3
e)	Define Di-electric polarization and Di-electric constant.	L1	CO3
f)	Write any two properties of anti-ferro magnetic materials.	L1	CO3
g)	An electron is bound in one-dimensional potential box of size 1×10^{-10} m. Find its energy value in the ground state.	L3	CO5
h)	Define Fermi energy.	L1	CO5
i)	Show the variation of Fermi level with temperature in n-type semiconductor.	L2	CO4
j)	What is an intrinsic semiconductor?	L1	CO1

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Demonstrate the construction and working of Ruby laser.	L3	CO2	6 M
	b)	Explain pumping and illustrate various pumping mechanisms.	L4	CO4	4 M
OR					
3	a)	Explain acceptance angle and numerical aperture. Derive the expression for acceptance angle.	L3	CO2	7 M
	b)	Select and discus any three general applications of optical fiber.	L4	CO4	3 M
UNIT-II					
4	a)	Sketch the seven types of crystal systems with the Bravais Lattices.	L3	CO3	7 M
	b)	Copper has FCC structure and the atomic radius is 0.1278 nm. Calculate the inter planar spacing for (2 1 2) planes.	L3	CO3	3 M
OR					
5	a)	Explain Bragg's law of X-ray diffraction.	L3	CO3	3 M
	b)	Explain powder method to determine the crystal structure.	L4	CO5	7 M
UNIT-III					
6		Explain electronic polarization. Calculate the electronic polarizability in a Di-electric material.	L3	CO3	10 M

		OR			
7	a)	Explain the classification of magnetic materials into Dia, Para and Ferro magnetic materials.	L3	CO3	6 M
	b)	Differentiate soft and hard magnetic materials.	L4	CO5	4 M

UNIT-IV

8	a)	Interpret Schrodinger time independent wave equation for a particle.	L3	CO3	7 M
	b)	Explain the significance of wave function.	L4	CO5	3 M
		OR			
9	a)	Explain Fermi-Dirac distribution function and its variation with temperature.	L4	CO5	7 M
	b)	Explain the salient features of classical free electron theory of metals.	L3	CO3	3 M

UNIT-V

10		Calculate the density of electrons in the conduction band of an intrinsic semiconductor.	L3	CO2	10 M
		OR			
11	a)	Explain Hall effect and derive the expression for Hall coefficient.	L4	CO4	7 M
	b)	Infer any three applications of Hall effect.	L4	CO4	3 M