

Course Code: B23BS1102					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					R23
I B.Tech. I Semester MODEL QUESTION PAPER					
ENGINEERING PHYSICS					
CSE, CSIT, ECE, EEE & IT					
Time: 3 Hrs.			Max. Marks: 70 M		
Answer Question No.1 compulsorily					
Answer ONE Question from EACH UNIT					
Assume suitable data if necessary					
10 x 2 = 20Marks					
			CO	KL	M
1.	a).	State the Principle of Superposition.	1	1	2
	b).	Explain the double refraction phenomena of light.	1	2	2
	c).	What are lattice parameters?	2	2	2
	d).	Draw the lattice planes with Miller Indices (100) and (111).	2	2	2
	e).	What do you understand by polar and nonpolar dielectrics?	3	1	2
	f).	Define relative permeability, magnetic susceptibility and give their relation?	3	2	2
	g).	State the Heisenberg's uncertainty principle.	4	1	2
	h).	Define Fermi energy?	4	1	2
	i).	What are extrinsic semiconductors?	5	2	2
	j).	List out the characteristic properties of semiconductors.	5	2	2
5 x 10 =50Marks					
		UNIT-1			
2.	a).	Elaborate the essential conditions for producing sustained interference of light.	1	2	4
	b).	How are Newton's rings formed and deduce an expression for the wavelength of light?	1	3	6
		OR			
3.	a).	Analyze the diffraction of light at a single slit and obtain the condition for maxima.	1	4	6
	b).	What are Half wave plate and Quarter wave plate and mention their applications?	1	2	4
		UNIT-2			

4.	a).	Define Packing fraction of atomic crystals and calculate the Packing fraction for an FCC lattice?	2	3	5
	b).	What are Miller indices and explain how they are determined?	2	3	5
		OR			
5.	a).	Deduce the Bragg's X-ray diffraction condition?	2	3	5
	b).	Describe the Laue's method for the determination of crystal structure.	2	3	5
		UNIT-3			
6.	a).	Explain the different types of Polarizations possible in dielectrics.	3	2	4
	b).	Deduce the Clausius-Mosotti equation and explain its significance in dielectrics?	3	3	6
		OR			
7.	a).	Classify the Magnetic materials based on atomic magnetic moment.	3	2	4
	b).	Describe the hysteresis exhibited by a ferromagnetic material and explain it using a suitable theory.	3	3	6
		UNIT-4			
8.	a).	Obtain the Schrodinger's time independent wave equation.	4	3	6
	b).	Calculate deBroglie wavelength of an electron moving with a velocity of $1/20^{\text{th}}$ of the velocity of light?	4	3	4
		OR			
9.	a).	Give an account of successes and failures of classical free electron theory.	4	2	4
	b).	Obtain an expression for the electrical conductivity of a metal using Quantum free electron theory.	4	3	6
		UNIT-5			
10.	a).	Derive an expression for the density of electrons in the conduction band of an intrinsic semiconductor?	5	3	6
	b).	Describe the variation of Fermi energy with temperature and dopant concentration in n-type semiconductor.	5	2	4
		OR			
11.	a).	Discuss the Hall effect, in detail, and explain its significance.	5	3	6
	b).	Distinguish between drift and diffusion currents in semiconductors.	5	2	4

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as a, b splits or as a single Question for 10 marks