

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B/TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Second Semester

Chemical Engineering

PH3258 - Physics of Materials

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	What is the basic principle involved in solvo thermal synthesis of nanomaterials.	RE	1	2
2.	Define phase rule.	RE	1	2
3.	Define mean free path.	RE	2	2
4.	State Wiedemann Franz Law.	UN	2	2
5.	Write the principle of solar cell.	UN	3	2
6.	Explain the variation of Fermi level with temperature and impurity concentration of p-type semiconductor.	UN	3	2
7.	Define polarization of a dielectric material.	RE	4	2
8.	Differentiate soft and hard magnetic materials.	UN	4	2
9.	Write the applications of ceramics.	UN	5	2
10.	What are the benefits of biomaterials?	RE	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a i Explain the difference between homogeneous nucleation and heterogeneous nucleation.	UN	1	8
	ii Demonstrate phase diagram and its types.	UN	1	8
	Or			
	b i Illustrate the preparation of thin films by using PVD technique.	UN	1	8
	ii Outline nanomaterial's preparation by using Wet thermal and sol-gel method.	UN	1	8
12.	a i List out the drawbacks of classical free electron theory.	UN	2	8
	ii Derive an expression for electric conductivity of conducting materials kept in electrical field.	UN	2	8
	Or			
	b i Differentiate type 1 and a type 2 superconductors.	UN	2	8
	ii Briefly explain the applications of superconductors.	UN	2	8

13.	a	i	Derive an expression of a density of electrons in an intrinsic semiconductor.	UN	3	8
		ii	Define hall effect. Derive an expression for hall coefficient for n-type semiconductor.	UN	3	8
	Or					
	b	i	Explain the construction of solar cell.	UN	3	8
		ii	Explain the construction working of LED.	UN	3	8
14.	a	i	Interpret the types of insulation materials and explain their applications.	UN	4	8
		ii	Briefly explain the significance of Clausius-Mossotti equation in calculating the polarizability of the dielectric materials.	UN	4	8
	Or					
	b	i	Demonstrate domain theory of ferromagnetism.	UN	4	8
		ii	Differentiate soft and hard magnetic materials.	UN	4	8
15.	a		What are ceramics? Enumerate the types and application of ceramics.	UN	5	16
	Or					
	b		Summarize the following;	UN	5	16
		i)	Hydroxyapatite			
		ii)	Silicone			