

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

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

Second Semester

Electronics and Communication Engineering

PH3254 - Physics for Electronics Engineering

Regulations - 2021

Duration : 3 Hrs

Maximum: 100 Marks

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

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Define packing factor. What is its unit?	RE	1	2
2.	Define unit cell.	RE	1	2
3.	Mention the applications of GMR.	UN	2	2
4.	Give any two postulates of classical free electron theory.	UN	2	2
5.	Define intrinsic semiconductor.	RE	3	2
6.	What is p- type semiconductor.	RE	3	2
7.	What are optical materials.	RE	4	2
8.	What are the uses of plasmonics.	RE	4	2
9.	Outline about quantum confinement.	UN	5	2
10.	How carbon nanotubes are classified?	UN	5	2

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

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i What is atomic radius? Calculate atomic radius for SC, BCC and FCC structures.	RE	1	8
	ii Describe the crystal structure of diamond?	RE	1	8
	Or			
	b i What are Miller indices? Sketch to successive (110) (111) and (101).	RE	1	8
	ii Derive an expression for the interplanar spacing in a cubic structure.	RE	1	8
12.	a i Illustrate the postulates of classical free electron theory.	UN	2	8
	ii Write the expression for electric conductivity for a conducting material kept in an electrical field.	UN	2	8
	Or			
	b Discuss about the origin of ferromagnetism and exchange interaction in ferromagnetic materials.	UN	2	16

13.	a	i	Derive an expression for concentration of electrons in an n -type semiconductor.	UN	3	8
		ii	Briefly describe the variation of carrier concentration with temperature.	UN	3	8
Or						
	b	i	Differentiate direct and indirect band gap semiconductors.	UN	3	8
		ii	Write elaborate notes on carrier transport (drift, diffusion of electrons and holes) in semiconductors.	UN	3	8
14.	a	i	Demonstrate the construction working of light detector.	AP	4	8
		ii	Infer the construction working of solar cell.	AP	4	8
Or						
	b	i	Organize the construction and working of LED.	AP	4	8
		ii	Explain the construction and working of laser diode.	AP	4	8
15.	a	i	Formulate expression for density of states in quantum wells and quantum dot structure.	UN	5	8
		ii	Write the significance between Fermi energy and volume of the material.	UN	5	8
Or						
	b	i	Elaborates the properties and applications of carbon nanotubes.	UN	5	8
		ii	Explain single electron transistor.	UN	5	8