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**VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN**

[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]

Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

**Question Paper Code: 3003****B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – AUG. / SEP. 2023****First Semester****Computer Science and Engineering****U19PH105 – ENGINEERING PHYSICS****(Regulation 2019)****(Common to Information Technology, Biotechnology & Computer Science and Technology)****Time : Three Hours****Maximum : 100 Marks****Answer ALL the questions**

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

**PART – A**

Q.No.	Questions	(10 x 2 = 20 Marks)		
		Marks	KL	CO
1.	State Hooke's law.	2	K1	CO1
2.	List out any two applications of viscosity.	2	K1	CO1
3.	Define mean free path and collision time.	2	K1	CO2
4.	Define: Fermi distribution function.	2	K1	CO2
5.	State Bravais lattice.	2	K1	CO3
6.	Name methods by which ultrasonic waves are produced.	2	K3	CO3
7.	Write the properties of semiconductor.	2	K2	CO4
8.	Define: Shape Memory Alloys (SMA).	2	K1	CO4
9.	What is meant by population inversion?	2	K2	CO5
10.	Mention any two differences between single mode fibre and multi-mode fibre.	2	K2	CO5

**PART – B**

Q.No.	Questions	(5 x 16 = 80 Marks)		
		Marks	KL	CO
11. a)	i. Write a note on stress-strain diagram	8	K1	CO1
	ii. Describe an experiment to determine Young's modulus of a beam by non-uniformly.	8	K2	

		(OR)			
	b)	Describe an theory and experiment to determine coefficient of viscosity of liquid by Poiseuille's flow method.	16	K2	CO1
12.	a)	i. Obtain an expression for the thermal conductivity on the basis of the classical free electron theory of metals.	10	K3	CO2
		ii. State the postulates of classical free electron theory.	6	K1	
		(OR)			
	b)	i. Explain de-Broglie's wavelength in terms of accelerating potential associated with electrons.	8	K2	CO2
		ii. Based on Fermi-Dirac statistics, state the nature of Fermi distribution function. How does it vary with temperature?	8	K1	
13.	a)	Describe an HCP structure. Show that for an HCP structure $c/a = \sqrt{8/3}$ and hence calculate the packing factor for the HCP structure.	16	K2	CO3
		(OR)			
	b)	i. Explain the production of ultrasonics by magnetostriction method.	12	K2	CO3
		ii. Write a short note on Sonogram with neat sketch.	4	K1	CO3
14.	a)	i. How will you determine the energy gap of an intrinsic semiconductor?	8	K4	CO4
		ii. Explain the variation of Fermi level with temperature and impurity concentration in p type semiconductor.	8	K2	CO4
		(OR)			
	b)	i. Give a detailed account of metallic glasses, their method of production, properties and applications.	12	K2	CO4
		ii. List out the properties and applications of Shape Memory Alloys (SMA).	4		
15.	a)	i. Explain the principle, construction and working of Nd:YAG laser.	12	K2	CO5
		ii. Mention the applications of lasers in Medicine and industry.	4		
		(OR)			
	b)	Derive an expression for acceptance angle and numerical aperture of an optical fibre. Bring out the differences between step index and graded index fibre.	16	K2	CO5