Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 30002

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. / FEB. 2025
Second Semester
Electronics and Electrical Engineering
U23PH201 – ENGINEERING PHYSICS
(Common to Electronics and Communication Engineering
and Biomedical Engineering)
(Regulation 2023)

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

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	State Hooke's law.	2	K1	CO1
2.	Define the term 'Coefficient of viscosity'.	2	K1	CO1
3.	Give any two postulates of classical free electron theory.	2	K1	CO2
4.	Mention any two important features of quantum free electron theory of metals.	2	K2	CO2
5.	Sketch (110) plane and (111) plane for a cubic crystal.	2	K3	CO3
6.	Differentiate between destructive testing and non-destructive testing.	2	K2	CO3
7.	What are the differences between n – type and p – type semiconductor?	2	K2	CO4
8.	Define shape memory effect.	2	K1	CO4
9.	Compare the characteristics of laser and ordinary light.	2	K4	CO5
10.	Mention any two applications of optical fiber.	2	K2	CO5

PART – B

(5 x 16 = 80 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)		Deduce an expression for the couple to produce a unit twist in a long cylindrical wire fixed at one end. How is it used in the determination of modulus of rigidity of a wire.	16	K4	CO1
			(OR)			
	b)		Derive Poiseuille's expression for the volume of the liquid collected, when it is flowing through a capillary tube of length 'l' m in t second.	16	K3	CO1
12.	a)		Obtain an expression for the electrical conductivity and thermal conductivity of conductors on the basis of the classical free electron theory. What are the merits & drawbacks of classical free electron theory?	16	K3	CO2
			(OR)			
	b)		Apply Schrodinger's wave equation for a particle bound in an one dimensional potential well and obtain its Eigen value and Eigen function.	16	K3	CO2
13.	a)		Describe a HCP structure. Show that for an HCP structure c/a= 1.633 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.	Discuss in detail how SONAR is employed to locate the objects.	4	K2	
14.	a)	i.	Derive an expression for the electrical conductivity of an intrinsic semiconductors.	8	K3	CO4
		ii.	With a neat diagram, explain the construction and working of Light Emitting Diode (LED).	8	K2	
			(OR)			
	b)		Give a detailed account of metallic glasses, their method of production, properties and applications.	16	K1	CO4
15.	a)		Explain the principle, construction and working of CO_2 laser.	16	K2	CO5
			(OR)			
	b)	i.	Describe the propagation of light through an optical fibre. Bring out the differences between step index and graded index fibre.	12	K2	CO5
		ii.	Compute the numerical aperture and acceptance angle of an optical fibre from the following data. Refractive index of core n_1 = 1.55, Refractive index of cladding n_2 = 1.50 and surrounding medium (air) n_o = 1.	4	K4	