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: 30004

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. / FEB. 2026

Second Semester

Electrical and Electronics Engineering

U23PH201 – ENGINEERING PHYSICS

(Common to ECE, BME, CE and AE)

(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.	Give the examples for high viscous and low viscous liquids.	2	K1	CO1
3.	State any two postulates of classical free electron theory.	2	K1	CO2
4.	Define Fermi distribution function.	2	K1	CO2
5.	What are lattice parameters?	2	K2	CO3
6.	Mention some of the Engineering and Industrial applications of ultrasonics.	2	K2	CO3
7.	Differentiate between intrinsic and extrinsic semiconductor.	2	K2	CO4
8.	Distinguish between one way and two-way shape memory alloy.	2	K4	CO4
9.	What are the conditions necessary for stimulated emission of radiation?	2	K2	CO5
10.	State two major advantages of fiber optic communication over traditional copper wire systems.	2	K1	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 an 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 on the basis of the classical free electron theory.	16	K3	CO2
		(OR)			
	b)	Derive Schrodinger's time dependent wave equation and hence deduce the time independent Schrodinger's wave equation.	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)	Explain the production of ultrasonics by magnetostriction oscillator method.	16	K2	CO3
14.	a)	Obtain an expression for carrier concentration in an intrinsic semiconductor.	16	K3	CO4
		(OR)			
	b)	What are metallic glasses? Explain how they are prepared by rapid quenching method. List out the applications of metallic glasses.	16	K2	CO4
15.	a)	Explain the principle, construction and working of CO_2 laser.	16	K2	CO5
		(OR)			
	b)	i. Explain fibre optical communication system with a neat block diagram.	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	CO5