

EEE

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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: 3001

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – AUG. / SEP. 2023

Second Semester

Electrical and Electronics Engineering

U19PH207 – ENGINEERING PHYSICS

(Regulation 2019)

(Common to Electronics and Communication Engineering & Biomedical Engineering)

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.	Define Elasticity.	2	K1	CO1
2.	What is a torsional pendulum?	2	K1	CO1
3.	Mention any two merits of classical free electron theory.	2	K2	CO2
4.	State De Broglie's hypothesis.	2	K1	CO2
5.	Define Unit cell.	2	K1	CO3
6.	List out any two properties of ultrasonic waves.	2	K1	CO3
7.	With increase of temperature the conductivity of semiconductor increases while that of metals decreases. Give reasons.	2	K4	CO4
8.	Distinguish between one way and two way shape memory alloy.	2	K3	CO4
9.	Name some properties, which make laser light different from ordinary light.	2	K3	CO5
10.	Calculate the numerical aperture of an optical fiber, whose core refractive index is 1.55 and the cladding refractive index is 1.5.	2	K3	CO5

PART – B

(5 x 16 = 80 Marks)

Q.No.	Questions	Marks	KL	CO
11.	a) Give an explanation of torque. Obtain the expression for the couple per angular twist of a twisted cylindrical wire.	16	K2	CO1
	(OR)			
	b) i. Obtain Poiseuille's formula for rate of flow liquid through capillary tube.	8	K2	CO1
	ii. Explain Poiseuille's method for determination of co-efficient of viscosity of a liquid.	8		
12.	a) Deduce the mathematical expression for electrical conductivity and thermal conductivity of a conducting material and hence obtain Wiedmann-Franz Law.	16	K3	CO2
	(OR)			
	b) Derive an expression for energy levels of a particle enclosed in one-dimensional potential box of width 'a' and infinite height.	16	K3	CO2
13.	a) Determine the co-ordination number and packing density of a hexagonal close packed (HCP) structure. Show that an HCP structure demands an axial ratio of 1.633.	16	K2	CO3
	(OR)			
	b) What is Magnetostriction effect? Explain how ultrasonic waves can be produced by using Magnetostriction oscillator method.	16	K2	CO3
14.	a) Derive an expression for density of electrons in the conduction band and density of holes in the valence band of an intrinsic semiconductor.	16	K3	CO4
	(OR)			
	b) i. Describe the method used for the preparation of metallic glasses with neat sketch and list out the properties of metallic glasses.	12	K2	CO4
	ii. Mention any four applications of shape memory alloys.	4		
15.	a) Explain briefly how laser action is achieved in Nd-YAG laser system with suitable diagrams.	16	K2	CO5
	(OR)			
	b) i. Drive an expression for acceptance angle and Numerical Aperture of an optical fibre.	12	K3	CO5
	ii. Bring out the difference between the single mode and multi-mode fibre.	4		