



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

Question Paper Code: 30001

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

First Semester

Computer Science and Engineering

U19PH105 – ENGINEERING PHYSICS

(Common to IT and CST)

(Regulation 2019)

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.	Mention any one method of experiment to determine the coefficient of viscosity of high viscous and low viscous liquids.	2	K2	CO1
3.	Write any 2 success of free electron theory of solids.	2	K1	CO2
4.	Why Fermi Dirac statistics is used to find the number of energy levels of electrons in a conductor?	2	K2	CO2
5.	Compare packing factor of SCC, BCC and FCC.	2	K2	CO3
6.	Write two applications of SONAR.	2	K2	CO3
7.	Sketch the energy level diagram of n-type and p-type semiconductor.	2	K2	CO4
8.	Give any two properties of Shape Memory Alloys.	2	K1	CO4
9.	What is the principle of laser action?	2	K2	CO5
10.	Define: Acceptance angle and Numerical aperture.	2	K1	CO5

PART – B

(5 x 16 = 80 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Describe how the rigidity modulus of the material in the form of a wire determined by torsional pendulum using two symmetrical masses.	16	K2	CO1

		(OR)			
	b)	Obtain Poiseuille's formula for rate of flow of liquid through capillary tube method. Explain an experiment for the determination of co-efficient of viscosity of a low viscous liquid.	16	K2	CO1
12.	a)	i. Define thermal conductivity obtain an expression for thermal conductivity using free electron theory.	12	K3	CO2
		ii. Calculate the drift velocity of the electron with a mobility of $0.0035 \text{ m}^2 \text{ V}^{-1}\text{s}^{-1}$ in copper for an electric field strength of 0.5 V/m .	4		
		(OR)			
	b)	i. Explain de-Broglie's hypothesis and derive the de Broglie's wavelength for an electron.	16	K3	CO2
		ii. Calculate the wavelength associated with an electron subjected to a potential difference of 1.25 kV .			
13.	a)	i. What are Miller indices? Give the procedure for finding Miller indices of crystal planes.	16	K1	CO3
		ii. Draw the crystallographic planes for the Miller indices (100) and (110).			
		(OR)			
	b)	i. With a neat diagram, explain the construction and working of a Piezoelectric oscillator.	16	K1	CO3
		ii. Determine the velocity of an ultrasonic wave produced by a piezoelectric oscillator. The density of quartz crystal is 2650 Kg/m^3 and Young's modulus of quartz is $7.9 \times 10^{10} \text{ N/m}^2$.			
14.	a)	i. Mention the variation of fermi level with temperature in an intrinsic semiconductor.	16	K1	CO4
		ii. List the merits and demerits of quantum free electron theory.			
		(OR)			
	b)	What are metallic glasses? Explain how they are prepared by rapid quenching method. Write any 2 properties and applications of metallic glasses.	16	K1	CO4
15.	a)	Explain the principle, construction and working of Nd:YAG laser.	16	K2	CO5
		(OR)			
	b)	Discuss the classification of optical fibers based on the refractive index profile and number of modes of propagation.	16	K2	CO5