

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: 30003

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

Second Semester

Electrical and Electronics Engineering
U19PH207 – ENGINEERING PHYSICS

(Common to ECE & BME)

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

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

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define: Young's modulus and mention its unit.	2	K1	CO1
2.	Write down Poiseuille's formula for the flow of a liquid through a capillary tube.	2	K2	CO1
3.	What are the merits of classical free electron theory?	2	K2	CO2
4.	What is the use of density of states of an electron in a conductor?	2	K1	CO2
5.	Draw the crystallographic planes for the Miller indices (111) and (100).	2	K2	CO3
6.	What is inverse piezo electric effect?	2	K2	CO3
7.	Mention the significance of band gap of a semiconducting materials.	2	K2	CO4
8.	Write 2 properties of Shape Memory Alloys.	2	K1	CO4
9.	What are the conditions necessary for stimulated emission of radiation?	2	K2	CO5
10.	Mention the components involved in fibre optical communication system.	2	K2	CO5

PART – B

(5 x 16 = 80 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Derive an expression for co-efficient of viscosity of liquid by Poiseuille's method. Describe an experiment to determine the viscosity of liquid.	16	K2	CO1
	(OR)			
b)	Explain an experiment to determination the Young's modulus of elasticity of a wooden bar using uniform and non-uniform bending methods.	16	K2	CO1
12. a)	Obtain an expression for the thermal conductivity on the basis of the classical free electron theory and list out the success and drawbacks of classical free electron theory	16	K2	CO2
	(OR)			
b)	i. Derive an expression for energy levels of a particle enclosed in one – dimensional potential box of width 'a' and infinite height. ii. An electron is confined to a one dimensional potential well of width 1 Å. Calculate the lowest energy of the electron.	16	K3	CO2
13. a)	Explain the production of ultrasonic waves by magnetostriction oscillator method. Discuss its advantages and disadvantages.	16	K1	CO3
	(OR)			
b)	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	K1	CO3
14. a)	Explain the variation of Fermi level with temperature and derive an expression for concentration in n type and p type semiconductor.	16	K1	CO4
	(OR)			
b)	Give a detailed account of metallic glasses, their method of production, properties and applications.	16	K1	CO4
15. a)	i. Describe the construction and working of Homo junction semiconductor laser. ii. A laser transition takes place from an energy level at 3.2 eV to another level at 1.6 eV. Calculate the wavelength of the laser beam emitted.	16	K3	CO5
	(OR)			
b)	i. Describe the propagation of light through an optical fibre. Bring out the differences between step index and graded index fibre. ii. The refractive indices of the core and cladding are 1.6 and 1.49 respectively. Determine the critical angle at the core-cladding interface.	16	K3	CO5