



**G H Raisoni College of Engineering and Management, Pune**

( An Empowered Autonomous Institute affiliated to Savitribai Phule, Pune University, NAAC Accredited "A+" Grade)

First Year B. Tech.

(TERM-I)

CAE II Winter 2025 (2023 Pattern)

**Engineering Physics (23UBSL1204)**

(Time: - 01 Hour)

( Max. Marks:20 )

**Instructions to the students:**

- i) All questions are compulsory. ii) Neat diagrams must be drawn wherever necessary.
- iii) Figures to the right indicate full marks. iv) Use of scientific calculator is allowed
- v) Assume suitable data, if necessary.

Q.No.	Question	Marks	CO	BL
1	a) Explain with neat diagram, the process of absorption of light, spontaneous emission and stimulated emission of light. Which of these processes is maximized for LASER operation?	5	CO2	L2
	OR			
	b) Discuss how population inversion is achieved in He-Ne laser. Explain why it is necessary to take a narrow discharge tube in He-Ne laser.	5	CO2	L2
1	c) Differentiate between normal photography and Holography. Explain the process of reconstruction of image in Holography	5	CO3	L3
	OR			
	d) Illustrate how LASER can be used in Industry. A semiconductor laser emits photons of wavelength 620 nm. Calculate the energy associated with this photon.	5	CO3	L3
2	a) Sketch neat labeled diagram showing, effect of temperature variation on position of Fermi level in intrinsic and extrinsic semiconductors (p and n type)	6	CO4	L3
	OR			
	b) Hall coefficient of doped Silicon found to be in $3.9 \times 10^{-4} \text{ m}^3/\text{C}$ . The Resistivity of specimen is $8.33 \times 10^{-3} \text{ Ohm-m}$ Find the mobility and density of charge carriers. Discuss the significance of Hall effect.	6	CO4	L3
2	c) Draw IV characteristics of Solar Cell and explain following parameters (i) open circuit voltage (ii) short circuit current (iii) Fill factor	4	CO3	L3
	OR			
	d) Discuss construction and working of Light Emitting Diode.	4	CO3	L2

BL - Bloom's Taxonomy Levels (1- Remember, 2- Understand, 3 - Apply, 4 - Analyze, 5 - Evaluate 6 - Create)