Do Advind Karmey DO PRST

\$2023 (10)

## **Department of Physics & Photonics Science**

Subject: Lasers & Photonics

Subject Code:PH-323

Max. Marks: 50

Max. Time: 3Hours

Date: 5<sup>th</sup> May, 2023

Time:2.30-5.30am

Note: Attempt all questions

S.No.	Questions	Marks
1	Give an explanation of the workings of the laser's two-level	10
	pumping scheme. Derive the expression for Einstein's	
	Coefficients and discuss its significance.	
2.	Obtain the expression for coefficients for transition among two-	10
	level systems using time-dependent perturbation theory.	
3.	Discuss the line-broadening mechanism and corresponding line-	10
	shape function corresponding to the collision of atoms.	
4.	Consider a three-level laser system and assume that all the levels	10
	are nondegenerate. Obtain the expression for population	
	difference between levels 2 and 1 for the above-given system.	
5.	Explain what a photonic crystal and a liquid crystal are, as well as	10
	how they are classified.	