

	(b)	Explain the condition for spontaneous emission.	6
Q-3		Attempt all questions	(14)
	(a)	Explain the meta stable state in semiconductor.	8
	(b)	Explain population inversion for production of photons.	6
Q-4		Attempt all questions	(14)
	(a)	Explain the principle and working of a PN junction laser.	7
	(b)	Explain the principle and working of Nd-YAG laser.	7
Q-5		Attempt all questions	(14)
	(a)	Explain the principle of light communication through fiber.	6
	(b)	What is the difference between single mode and multi mode fiber? Explain with suitable figure.	8
Q-6		Attempt all questions	(14)
	(a)	In an optical fiber, the core material has refractive index is 1.43 and refractive index of clad material is 1.4. Find the propagation angle.	7
	(b)	Calculate the numerical aperture of an optical fiber from the following data: n_1 (core)=1.546 and n_2 (cladding) =1.378	7
Q-7		Attempt all questions	(14)
	(a)	Prove: $B_{21}=B_{12}= \frac{c^3}{8\Omega h^3 \mu^3} A_{21}$	7
	(b)	Explain the Fourier transforming property of a thin lens.	7
Q-8		Attempt all questions	(14)
	(a)	What is holography? Show with figure.	6
	(b)	Explain the working principle of holography.	8

