

Solution:

1.	a. Population Inversion, Need b. Diagram, Types, Types representation c. Any 5 points d. Any 5 applications	2Mk, 3Mk 2Mk, 2Mk, 1Mk 1Mk each 1Mk each
2.	a. Ways on Interaction, explanation in detail b. Diagram, Explanation.	4 Mk, 6Mk 4 Mk, 6Mk
3.	a. Consider a multimode silica fiber that has core refractive index $n_1 = 1.480$ and cladding index $n_2 = 1.460$. Find: i. The Critical Angle, ii. The numerical aperture, iii. The acceptance angle b. Modal Equation, Formula, Types, Diagrams	Each parameter- 2Mk, steps- 2 Mk 3Mk, 3Mk, 2Mk, 2Mk
4	a. Diagram, Explanation. b. Sustainable laser action, Types of Pumping, one type in detail	4 Mk, 6Mk 3Mk, 2Mk, 5Mk
5	a. Need of laser resonator, Types- Name, Diagram, details b. Construction diagram, energy diagram, explanation	4mk, 3Mk, 3Mk 3Mk, 3Mk, 4Mk
6.	Write short notes on (Any four) a. Semiconductor diode laser- Diagram, explanation b. Applications of laser in Ophthalmology- any 4-5 c. Optical Fiber Splicing- Need, Types, Application d. Practical Laser safety requirements- 5 Points e. Video Endoscopes- Basic Principle, Explanation, Applications	2Mk, 3Mk 1 Mk each 2Mk, 2mk, 1Mk 1Mk each 2Mk, 2Mk, 1Mk