

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3170314**Date:19-12-2023****Subject Name: LASER and Fiber Optics in Medical Technology****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) State the difference between ordinary light and LASER light.	03
	(b) What is light guiding? List applications of light guiding.	04
	(c) Draw and explain block-diagram of simple fiber optic system.	07
Q.2	(a) What is coherence? Explain use of coherence in optical transmission.	03
	(b) Explain the phenomenon of reflection and refraction.	04
	(c) Explain Snell's law with schematic and equation.	07
OR		
	(c) What are the ways by which the light can be lost from fiber optic cable while transmission?	07
Q.3	(a) Explain the phenomenon of total internal reflection.	03
	(b) Write a note on electromagnetic spectrum.	04
	(c) What is decibel? Explain the use of decibels in fiber optic system.	07
OR		
Q.3	(a) List types of endoscopes with their applications.	03
	(b) State and explain different bending losses.	04
	(c) Draw and explain constructional diagram of endoscope.	07
Q.4	(a) List the properties of LASER light.	03
	(b) Classify LASERS on the different basis.	04
	(c) Explain working principle of LASER with proper schematics.	07
OR		
Q.4	(a) What is refractive index? What are the consequences upon changing refractive indices while optical transmission.	03
	(b) Explain the optical response of tissue upon optical stimulation.	04
	(c) Explain use of fiber optic and LASER in gastroenterology.	07
Q.5	(a) How LASER power can be measured? Define its unit.	03
	(b) Explain thermal interactions between LASER and tissue.	04
	(c) Explain use of fiber optic and LASER in oncology.	07
OR		
Q.5	(a) What is the use of fiber optics and LASER in orthopedics	03
	(b) Write a note on Angioscope.	04
	(c) Explain use of fiber optic and LASER in neurosurgery.	07
