

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3170314****Date: 19/06/2023****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) Define: Critical Angle, Cone of Acceptance.	03
	(b) Explain Electromagnetic Waves-Spectrum in brief.	04
	(c) Explain Bending losses & dispersion in fiber optics.	07
Q.2	(a) Explain Total Internal Reflection with a neat Diagram.	03
	(b) What is Snell's Law?	04
	(c) Explain Transmission of light through straight transparent slab and bend slab in detail.	07
OR		
	(c) Write a short note on "Laser physics".	07
Q.3	(a) Describe properties of LASER light.	03
	(b) Explain Major types of laser.	04
	(c) Define Medical Laser and explain laser safety in detail.	07
OR		
Q.3	(a) Give Advantages of Optical Fibers over Copper wires.	03
	(b) Explain these terms: Active medium, Pumping Mechanism.	04
	(c) Write a short note on Co2 laser.	07
Q.4	(a) Describe Laser-Assisted Diagnosis in brief.	03
	(b) Explain photodynamic therapy.	04
	(c) Write a short note on fiber optic biomedical sensor-principles.	07
OR		
Q.4	(a) Define: Hyperthermia & Bio stimulation	03
	(b) Explain Laser interaction with tissue-Reflection, refraction, Scattering.	04
	(c) Write a short note on Endoscopic ultrasound imaging-principles.	07
Q.5	(a) Explain any one application of Indirect Fiber optic Sensor.	03
	(b) Draw a diagram of Endoscope showing major parts.	04
	(c) Write a short note on application of LASER in Ophthalmology.	07
OR		
Q.5	(a) Enlist types of Endoscopy.	03
	(b) Write a short note on Fluorescence endoscopy.	04
	(c) Explain Fiber optic Laser system in cardiovascular disease.	07
