

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2170312

Date:27/05/2019

Subject Name:Medical Optics

Time:02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Draw and explain a simple fiber optic system.	03
	(b) What is wavefront? Brief about Characteristics of wavefront. Also write equation for speed of light in the material.	04
	(c) Explain snell's law. Calculate angle of refraction for given values $n_1=1.51$ , $n_2=1.46$ , $\phi_1=38^\circ$ .	07
Q.2	(a) A light ray is traveling in a transparent material of refractive index 1.51 and approaches a second material of refractive index 1.46. Calculate the critical angle.	03
	(b) What happens to the light if it approaches to the boundary at an angle less than critical angle? Explain total internal reflection.	04
	(c) Explain operation of LASER with proper schematics. Also give classification of LASER.	07
OR		
	(c) Draw and explain Basic Endoscopic Imaging system.	07
Q.3	(a) Explain Cone of Acceptance and Numerical Aperture.	03
	(b) Compare different properties of ordinary light and LASER light.	04
	(c) Explain the process of manufacturing of optical fiber.	07
OR		
Q.3	(a) Explain types of scattering.	03
	(b) Explain transverse electromagnetic modes.	04
	(c) Enlist types of interaction occurs between LASER and tissue. Explain any two in detail.	07
Q.4	(a) Explain Micro bends.	03
	(b) Explain LASER welding of tissue and LASER coagulation.	04
	(c) Explain application of LASER in therapy.	07
OR		
Q.4	(a) Write a note on Electromagnetic Spectrum.	03
	(b) Explain effect of Dispersion on data transmission.	04
	(c) Fiber optic Laser system in Neurosurgery	07
Q.5	(a) Explain graded index fiber.	03
	(b) Explain LASER lithotripsy.	04
	(c) Explain ophthalmological application of LASER.	07
OR		
Q.5	(a) What is mode? Give the formula to calculate modes in optical fiber.	03
	(b) Explain Rayleigh scattering and Fresnel reflection.	04
	(c) Explain Fiber Optic Laser system in cardiovascular disease.	07

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