Seat No: _____

GANPAT UNIVERSITY

B.TECH SEM. VII BIOMEDICAL & INSTRUMENTATION ENGINEERING

CBCS REGULAR EXAMINATION NOVEMBER 2015

2BM704: LASER & FIBER OPTICS IN MEDICINE

TIME: - 3 HOURS **TOTAL MARKS: - 70**

INSTRUCTION: - 1. Write the answer of each section in separate answer sheet.
2. Figure to the right indicates full marks.
3. Assume suitable data if necessary.

SECTION-I

Que-1			12
	(a)	Explain Double Hetro-structure LASER.	6
	(b)	Explain Different Properties of LASER.	6
		OR	
Que-1			12
	(a)	Explain Optical Resonator and Optical Amplifier.	6
	(b)	Explain different arrangements of Dye LASER.	6
Que-2			11
	(a)	Explain Working of He-Ne LASER with neat diagram.	5
	(b)	Explain KrF LASER with neat diagram.	6
		OR	
Que-2			11
	(a)	Explain CO_2 Laser With Neat Diagram.	6
	(b)	Draw and explain operation of Ruby LASER.	5
Que-3			12
	(a)	Describe the following term: reflection, refraction, acceptance cone, path length.	4
	(b)	Give difference between optical pumping and electron collision pumping.	4
	(c)	Explain Photothermal effect of Laser on tissue.	4

SECTION-II

Que-4			12
	(a)	Explain different factor that determines which Laser-tissue interaction will take place.	6
	(b)	Explain Explicit Dosimetry for PDT	6
		OR	
Que-4			12
	(a)	Explain different Hazard classes of LASER.	6
	(b)	Explain different De-Excitation Pathways for excited molecules of Tissues.	6
Que-5			11
	(a)	What is preform? Describe the fabrication process of optical fibers with neat diagram.	6
	(b)	Write the name four types of dispersion & explain each briefly.	5
		OR	
Que-5			11
	(a)	What is refractive index profile? Enlist the classification of optical fiber according to material composition and explain each briefly.	5
	(b)	Justify the statement with example: "Number of modes in optical fiber depends on wavelength and core diameter".	6
Que-6			12
	(a)	What is the name of a fiber with a core whose refractive index varies? Explain this optical fiber with neat diagram.	4
	(b)	Enlist the main part of single fiber cable. Describe the following term briefly: loose buffer and tight buffer.	4
	(c)	Explain the operation of simple analog laser drive circuit with neat circuit diagram.	4

Best of Luck