Reg. No.												

Question Paper Code	12173

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

Seventh Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

EI8075 - FIBER OPTICS AND LASER INSTRUMENTATION

(Regulations 2017)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What is total internal reflection?	*2,K1,CO1*
2.	Define Waveguide.	*2,K1,CO1*
3.	Explain extrinsic and intrinsic sensors.	*2,K2,CO2*
4.	List the process variables that can be measured using optical fibers.	*2,K1,CO2*
5.	Define monochromaticity.	*2,K1,CO3*
6.	State the advantages of the liquid laser.	*2,K1,CO3*
7.	List the types of Laser welding.	*2,K1,CO4*
8.	State the applications of LIDAR.	*2,K1,CO4*
9.	What are the different laser interactions with tissues?	*2,K1,CO5*
10.	Distinguish between a hologram and a photographic film.	*2,K2,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Describe the different types of fibres and their properties with neat sketches.	*13,K2,CO1*
		OR	
	b)	Explain the difference between step index and graded index fiber.	*13,K2,CO1*
12.	a)	Describe the principle of Measurement of current and voltage using fiber optic sensor.	*13,K2,CO2*
		OR	
	b)	Explain about the classification of optical modulators.	*13,K2,CO2*
13.	a)	Explain in detail about Q switching and mode locking with neat diagram.	*13,K2,CO3*
		OR	

b) Describe the construction and working of a gas laser with neat diagram. *13,K2,CO3*

14. a) Explain in detail the principle of Laser welding and melting. *13,K2,CO4*

OR

b) Explain the working principle of Laser for the measurement of atmospheric effect with a neat diagram. *13,K2,CO4*

15. a) Explain in detail the principle of Holography for non-destructive testing. *13,K2,CO5*

OR

b) Explain any two medical applications of laser. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Explain the Properties of the Laser and derive an expression for threshold gain for the laser. *15,K2,CO3*

OR

b) With the help of an energy diagram, analyze how four level laser system is advantageous over three level laser system. *15,K2,CO3*