

Question Paper Code : 50552

Seventh Semester

Electronics and Instrumentation Engineering

EI 8075 – FIBRE OPTICS AND LASER INSTRUMENTATION

(Common to : Electrical and Electronics Engineering/Instrumentation and Control Engineering)

(Regulations – 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Compare Meridional ray and Skew ray.
2. State Snells Law.
3. Differentiate extrinsic and intrinsic fiber optic sensor.
4. What are Moire Fringes?
5. List out the applications of carbon di oxide laser.
6. What is cavity damping?
7. Why population inversion is significant in Lasers?
8. How are lasers used for current measurement?
9. What is the principle of holography?
10. Identify the requirements of laser instruments for surgery.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the different types of fibers and their characteristics with neat sketches.

Or

- (b) Explain the construction and working of LED and PIN diode as a optical sources.

12. (a) Explain the working principle of different types of modulators with neat diagram.

Or

- (b) Elaborate how optical fibers can be used to measure temperature, liquid level and strain.

13. (a) Write short notes on Q-Switching and cavity damping. (7+6)

Or

- (b) With neat diagram, explain about the construction and working of Semiconductor laser.

14. (a) Describe the industrial applications of LASER in material processing.

Or

- (b) Discuss in detail about the construction, working and applications of LIDAR.

15. (a) Briefly explain about Holography for Non-Destructive Testing.

Or

- (b) Write notes on (i) Laser tissue interaction (ii) Removal of tumors using Laser. (7+6)

PART C — (1 × 15 = 15 marks)

16. (a) Examine about the different types of losses in optical fiber.

Or

- (b) Analyze how four level laser system is advantageous to three level laser system with the help of energy diagram.