

103

Reg. No. :

**Question Paper Code : 90535**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

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. Define critical angle.
2. What is total internal reflection?
3. Mention any two advantages of fiber optic sensors.
4. Differentiate intrinsic and extrinsic fiber optic sensor.
5. State the principle of Q-switching.
6. Compare LED and Laser.
7. List the types of laser hardening techniques.
8. Write the applications of LIDAR.
9. What is laser welding?
10. Distinguish between holography and photography.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the steps in index fiber structure and graded index fiber structure.

Or

- (b) Explain the basic components of optical fiber communication in detail.

12. (a) With a schematic block diagram, explain the measurement of length using Lasers.

Or

- (b) Analyze the features of fiber optic sensors and point out their uses in the measurement of current and voltage.

13. (a) Sketch the energy band diagram and the constructional details of a Semiconductor laser and explain.

Or

- (b) Illustrate with examples of two-level and three-level laser.

14. (a) With a neat block diagram, Interpret the operation of LIDAR.

Or

- (b) Elaborate on laser usage for the measurement of length.

15. (a) Discuss material removal and vaporization using lasers.

Or

- (b) Elaborate on the measurement of atmospheric Effect using lasers.

PART C — (1 × 15 = 15 marks)

16. (a) Critique on the laser treatments in the field of Gynecology.

Or

- (b) Apply Holographic principle in construction and reconstruction of an image and explain in detail.