

23.12.2022

Reg. No.

Question Paper Code

11511

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Seventh Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

EI8075 - FIBRE OPTICS AND LASER INSTRUMENTATION

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|-------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Define critical angle. | 2,K1,CO1 |
| 2. Mention three advantages of optical fiber as a waveguide over the conventional metallic waveguide. | 2,K1,CO1 |
| 3. What is Kerr effect? | 2,K1,CO2 |
| 4. Explain extrinsic and intrinsic sensors. | 2,K2,CO2 |
| 5. What is passive mode-locking? | 2,K1,CO3 |
| 6. State the advantages of the liquid laser. | 2,K1,CO3 |
| 7. What are the uses of shielding gas during material processing by lasers? | 2,K1,CO4 |
| 8. List the types of Laser welding. | 2,K1,CO4 |
| 9. Distinguish between a hologram and a photographic film. | 2,K2,CO5 |
| 10. What is the role of laser in medical surgery? | 2,K1,CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Explain the difference between Single mode and multimode Fiber. 13,K2,CO1
- OR**
- b) Explain in detail about mechanical characteristics of optical fiber. 13,K2,CO1
12. a) Explain in detail the measurement of Strain using a fiber optic sensor. 13,K2,CO2
- OR**
- b) Explain the working principle of the Optical time domain reflectometer. 13,K2,CO2
13. a) Explain in detail about Q switching and mode locking with neat diagram. 13,K2,CO3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

11511

OR

b) Differentiate a three-level laser from a four-level laser. Explain in detail about semiconductor lasers. 13,K2,CO3

14. a) Explain the working principle of Laser for the Measurement of Current and Voltage. 13,K2,CO4

OR

b) Explain the working principle of Laser for the Measurement of Length. 13,K2,CO4

15. a) Explain the basic principle of holography and explain the methods of holographic interferometry. 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 working principle of Laser for the measurement of atmospheric effect with a neat diagram. 15,K2,CO4

OR

b) Explain the application of Laser in material processing. 15,K2,CO4