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**Question Paper Code: 39609**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Elective

Instrumentation and Control Engineering

01UIC909 - FIBRE OPTICS AND LASER INSTRUMENTS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State the basic principle of light propagation.
2. Mention the advantages of optical fiber as waveguide over conventional metallic waveguide.
3. List the commonly used optical modulators?
4. Write concept of temperature measurement by optical fiber.
5. Mention the basic characteristics of Laser.
6. Summarize the applications of liquid lasers.
7. Give the principle behind laser based velocity measurement.
8. How do you perform the measurement of velocity using laser?
9. What is holography?
10. What are the laser surgeries possibly done?

PART - B (5 x 16 = 80 Marks)

11. (a) Discuss the different types of fibers with their neat diagrams.

(16)

Or

(b) (i) Derive wave equations for step index fiber and explain. (8)

(ii) With neat diagram explain the construction and working of LED source. (8)

12. (a) With a neat diagram, describe the working principle of Michelson Interferometer. (16)

Or

(b) With a diagram, describe the functioning of fiber optic temperature sensor. (16)

13. (a) Describe the functioning of three level laser with a neat diagram. (16)

Or

(b) With a neat diagram, explain the functioning of a ruby laser. (16)

14. (a) Draw and explain Time- Of- Flight (TOF) laser ranging system to measure the distance. (16)

Or

(b) Explain the industrial application of LASER in material processing. (16)

15. (a) With a neat block diagram, describe the working of holographic interferometry. (16)

Or

(b) (i) Describe the laser instruments for surgery and removal of vocal cords. (8)

(ii) Explain the medical applications of laser in gynecology and oncology. (8)

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