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Question Paper Code: 39506

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Electronics and Instrumentation Engineering

01UEI906 - LASER AND FIBRE OPTICS INSTRUMENTATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Give any four desirable properties of lasers.
2. List the different types of lasers based on the state of matter of the active medium. Give one example for each.
3. Identify the applications of laser in industry?
4. What are the advantages of laser welding?
5. Write any two applications of holographic interferometry.
6. What is an optical fiber?
7. What is an optical fiber?
8. What are the various losses in an optical fiber?
9. Give the basic principle of fiber optic gyroscope.
10. In what ways the optical fibers are used in instrumentation?

PART - B (5 x 16 = 80 Marks)

11. (a) How is a three level laser different from a four level laser? With suitable energy level diagram, describe the construction and working of a four level laser. (16)

Or

- (b) Explain the construction and operation of semi-conductor LASER. (16)
12. (a) Explain in detail how laser is used to measure the following industrial parameters:
(i) current (ii) voltage (iii) pollution. (16)
- Or
- (b) Enlighten the industrial applications of laser in material processing. (16)
13. (a) Describe any four applications of LASER in surgery. (16)
- Or
- (b) Explain holographic interferometry. Illustrate any two applications of it with relevant diagrams. (16)
14. (a) Discuss about various types of fibre optic losses in detail. (16)
- Or
- (b) Explain in detail the various losses in optical fiber. (16)
15. (a) Elucidate the working principle of electro optic modulators with neat sketches. (16)
- Or
- (b) Explain the measurement of pressure, temperature and change in orientation using optical fibres. (16)
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