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Question Paper Code : 31434

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Seventh Semester

Electronics and Instrumentation Engineering

EI 2404/EI 74/EI 1354 A/IC 1002/10133 EI 704 – FIBRE OPTICS AND LASER INSTRUMENTS

(Common to Sixth Semester – Instrumentation and Control Engineering and Electrical and Electronics Engineering)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Enumerate the different types of glass fibers. Mention a potential application of each.
2. Define Intermodal and Intramodal dispersions.
3. What are the different types of fiber optic sensors?
4. What is the Principle of Acousto optic modulator?
5. Why optical pumping is preferred in lasers?
6. What is the Principle of Double hetero structure Laser?
7. Write the features of laser melting.
8. What is the significance of shielding gas during the material Processing by lasers?
9. Mention the components of Hologram.
10. What is the principle of Fiberscope?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compare and Contrast the different parameters of glass fibers with plastic fibers. (8)
- (ii) Explain the requirements for an ideal optical source and an ideal optical detector. (8)

Or

- (b) (i) Explain the types of loss due to Scattering in optical fibers. (8)
- (ii) Differentiate an Optical connector from a Splicer. Explain any one Splicer with a neat diagram. (8)
12. (a) (i) Explain the role of optical fibers in the measurement of pressure, in detail. (10)
- (ii) Give an account on "Moire Fringes". (6)

Or

- (b) (i) Explain the working principle of Electro optic modulator with a neat sketch. (8)
- (ii) Explain the Principle of laser for measurement of temperature. (8)
13. (a) (i) Explain the difference between direct and indirect band gap semiconductors. Give examples. (6)
- (ii) Explain the structure of Fabry Perot resonator and its principle of operation with a neat diagram. (10)

Or

- (b) (i) Distinguish 3 level laser from 4 level laser. Explain the concept of population inversion in them. (8)
- (ii) Explain the Principle of working of a Semiconductor laser with a diagram. (8)
14. (a) Describe the principle of lasers for measurement of length and velocity with neat block diagrams. (16)

Or

- (b) Explain the applications of laser in
- (i) Trimming of material
- (ii) Heating
- (iii) Vaporization. (5 + 5 + 6)

15. (a) (i) Explain the basic principle of holography with neat diagrams. (8)
(ii) Explain the special features of holography for NDT. (8)

Or

- (b) Write technical notes on : (5 + 5 + 6)
(i) Lasers for removal of tumors of vocal cords.
(ii) Lasers for plastic surgery
(iii) Lasers for Oncology.
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