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Question Paper Code : P 1298

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Seventh Semester

Electrical and Electronics Engineering

EI 1001 — FIBER OPTICS AND LASER INSTRUMENTS

(Common to Electronics and Instrumentation Engg./Instrumentation and Control Engineering)

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the principle used in the working of fibres as light guides?

2. Among the different fibres which has the least dispersion?

3. Why do we require modulation?

4. What are Moire fringes?

5. Define "Q-switching and mode locking".

6. What are the characteristics of laser?

7. What is meant by laser action? What are the conditions to achieve it?

8. Mention the merits and demerits of laser welding.

9. State the basic principle of holography.

10. List any four medical applications of laser.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Classify Optical fibres based on the modes of propagation and refractive index profile and discuss their properties. (8)

(ii) Discuss the different scattering losses in optical fibre at the operating wavelength. (8)

Or

(b) (i) Explain the different types of Connectors and Splicers. (8)

(ii) Give an account of the Optical detector response time and its influence on detector parameters. (8)

12. (a) (i) Explain any two Fibre optic sensors. (8)

(ii) Give the principle and design of an optical modulator. (8)

Or

(b) (i) Explain the mechanisms involved in interferometric method for the measurements of length. (8)

(ii) How will you measure the pressure and temperature by using an optical fibre? Discuss. (8)

13. (a) (i) Describe the construction and working of a gas laser. (8)

(ii) Give an account of (1) laser modes and (2) resonator configuration. (8)

Or

(b) (i) Explain the construction and working of semiconductor laser. (8)

(ii) Write notes on cavity damping and mention the advantages of gas laser over solid state laser. (8)

14. (a) How will you measure the acceleration and current by using laser? Explain. (16)

Or

(b) Explain how the laser is used in material processing. (16)

15. (a) Discuss the construction and working of holographic interferometry and mention its applications. (16)

Or

(b) Give an account of laser surgery instruments which are used in plastic surgery and gynaecology. (16)

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