

Total No. of Questions : 10]

SEAT No. :

P4004

[4959]-1199

[Total No. of Pages : 2

B.E. (Instrumentation & Control)
OPTO-ELECTRONICS INSTRUMENTATION
(2012 Course) (Elective - II) (Semeter - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to candidates:

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 Q7 or Q8, Q9 or Q10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Use of electronic pocket calculator is allowed.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Explain the process of generation of Laser radiation. **[5]**

b) Determine the numerical aperture and critical angle for a step index fiber with core and cladding refractive indices as 1.49 and 1.45 respectively. **[5]**

OR

Q2) a) List out the properties of Laser. **[5]**

b) Explain any one application of Laser system. **[5]**

Q3) a) Explain the intrinsic and extrinsic absorption losses in optical fiber. **[4]**

b) Explain the design considerations and characteristics of optical fiber system. **[6]**

OR

Q4) a) Compare the PIN diode and avalanche photodiode. **[4]**

b) Describe the structure of LED as light source in optical fiber with the help of neat diagram. **[6]**

P.T.O.

Q5) Write short notes on:

- a) Optical fiber amplifier. [8]
- b) Integrated optics. [8]

OR

Q6) Explain following with neat diagram:

- a) Beam splitter. [4]
- b) Directional coupler. [4]
- c) Optical modulators. [4]
- d) Optical switches. [4]

Q7) a) What are the advantages and disadvantages of fiber optic sensing system? [8]

- b) Explain the principle, working and construction of a fiber optic-displacement sensor. [8]

OR

Q8) a) Explain the principle and working of fiber-optics based position sensors. [8]

- b) Explain the principle, working and construction of a fiber optic-displacement sensor. [8]

Q9) Explain following applications of lasers with its neat schematic:

- a) Laser interferometer. [9]
- b) Speckle pattern instrument. [9]

OR

Q10) Write short notes on:

- a) Distributed optical fiber sensing. [9]
- b) Fiber grating sensors. [9]

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