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16117

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following:** **20**
- a) Define following terms -
- (i) Numerical Aperature
- (ii) Acceptance angle
- b) Compare LED and Laser Diode.
- c) Define the following terms for optical.
- (i) Detectors
- (ii) Responsivity
- (iii) Dark current
- d) Write any four principle requirement of good connector.
- e) Explain the use of
- (i) Under sea optical system
- (ii) Fiber coupler

P.T.O.

- f) Write applications of
 - (i) SONET
 - (ii) WDM
- g) Compare between PIN photo diode and Avalanche photo diode.

2. Attempt any FOUR of the following: 16

- a) Draw and explain block diagram of fiber optic communication system.
- b) Explain the term inter-modal dispersion.
- c) Explain following lossess in optical fiber.
 - (i) Absorption lossess
 - (ii) Bending lossess
- d) Draw and explain optical time domain reflectometer.
- e) What is fiber splicing explain fusion splicing.
- f) Define any four basic laws of optics.

3. Attempt any FOUR of the following: 16

- a) State different types of fiber connectors. Explain any one of them.
- b) Draw the schematic of surface emitting LED and write any two characteristics of LED.
- c) State the explain any four advantages of optical fiber communication system over conventional electrical communication system.
- d) Compare Step index and Graded index optical fibers.
- e) Write three possible types of misalignment occur when joining compatible optical fibers. Draw and explain any one.
- f) Draw the simple block diagram of optical digital system and explain.

- 4. Attempt any FOUR of the following:** **16**
- a) Draw and explain optical circulator.
 - b) Write spectral band designations used in optical fiber communication.
 - c) Draw and explain step index fiber optic cable.
 - d) Draw the construction of PIN photo diode and explain.
 - e) Explain with figure mechanical splicing.
 - f) Draw and explain optical analog communication system.
- 5. Attempt any TWO of the following:** **16**
- a) List four different types of LASERS. Explain any one Laser Diode construction. Working principle and its characteristics.
 - b) Explain fully Hybrid multi channel analog and Digital optical system write its applications.
 - c) Give the classification of optical fibers on index profile and mode profile. Explain multimode graded index optical fiber.
- 6. Attempt any TWO of the following:** **16**
- a) Draw the construction of Avalanche photo diode. Explain its working advantages and disadvantages.
 - b) Explain how fiber optic cables are fabricated.
 - c) Explain construction, working and characteristics of photo diode.
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