

22647

12425

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

5 × 2 = 10

- (a) List two types of LED's used as source in Optical Fibre Communication.
- (b) Define :
 - (i) Acceptance angle
 - (ii) Acceptance cone
- (c) Define Insertion loss in optical network.
- (d) List two conditions required for occurrence of Total Internal Reflection.
- (e) Define :
 - (i) Passive Satellite
 - (ii) Active Satellite
- (f) List four elements of Transponder.
- (g) Draw construction of fibre optic cable.



2. Attempt any THREE :**3 × 4 = 12**

- (a) Compare Step Index fibre and Graded Index fibre w.r.t.
 - (i) Data rate
 - (ii) Ray path diagram
 - (iii) Material used
 - (iv) Attenuation of light
- (b) Develop an Optical Time Domain Reflectometer (OTDR) system to determine losses in optical cable.
- (c) Identify the need of WDM in optical network.
- (d) Explain the effect of atmospheric drag on satellite motion.

3. Attempt any THREE :**3 × 4 = 12**

- (a) Explain V groove splice with neat diagram.
- (b) Specify the common carrier frequencies used in satellite communication and their features.
- (c) Describe the working of optical switch.
- (d) The orbit of an earth orbiting satellite has an eccentricity of 0.15 & semi major axis 9000 km. Determine Apogee.
[Assume mean value of earth radius 6371 km]

4. Attempt any THREE :**3 × 4 = 12**

- (a) Explain WDM system with diagram.
- (b) Describe the power sub system used in space craft system.
- (c) An optical fibre system is designed using silica optical fibre with core diameter large having refractive index of 1.50 and clad having refractive index of 1.47. Calculate
 - (i) Critical angle
 - (ii) Numerical aperture of fibre
 - (iii) Acceptance angle of fibre in air

- (d) Explain the effect of atmospheric drag on motion of satellite.
- (e) Compare LED and LASER w.r.t.
 - (i) Intensity of light
 - (ii) Numerical aperture
 - (iii) Speed of operation
 - (iv) Ease of operation

5. Attempt any TWO :

2 × 6 = 12

- (a) Select a typical mode of fibre used for long haul communication. Justify the selection.
- (b) Identify the need of VSAT in communication. List the advantages and disadvantages of VSAT systems.
- (c) Explain any three losses which occurs in fibre optic cable.

6. Attempt any TWO :

2 × 6 = 12

- (a) Explain SONET/SDH architecture with neat diagram.
 - (b) Specify the frequencies for :
 - (i) Broadcast services
 - (ii) GPS
 - (iii) Maritime mobile
 - (iv) DTH services
 - (v) Telephone network
 - (vi) Search & Resume services
 - (c) Draw the block diagram of GPS system and explain the transmitter and receiver section.
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