



22647

12223

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.

Marks**1. Attempt any FIVE of the following :****10**

- (a) Draw frequency spectrum of optic fiber communication.
- (b) Define numerical aperture and give its mathematical expression.
- (c) Define :
 - (i) Look angle
 - (ii) Foot print
- (d) List various elements of the transponder.
- (e) State uplink and down link frequencies for C Band and X Band.
- (f) List the types of optical switches.
- (g) Specify the function of telemetry and tracking control subsystem in satellite communication.



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P.T.O.



2. Attempt any THREE of the following :

- (a) Explain how power is generated in satellite and how it is distributed to other sub-system of satellite.
- (b) Explain the following terms :
 - (i) Apogee
 - (ii) Perigee
- (c) Explain working of VSAT.
- (d) With the help of ray diagram explain the concept of total internal reflection used in optical fiber.

3. Attempt any THREE of the following :

12

- (a) In comparison to traditional communication system, state any four advantages which proves optical communication system to be superior.
- (b) Map the satellite services with the frequency band used for it.
- (c) Explain with diagram wave division multiplexing process.
- (d) Explain the technique used for joining two fiber optic cables.

4. Attempt any THREE of the following :

12

- (a) Explain the working of satellite transponder.
- (b) Draw and explain working of avalanche photodiode.
- (c) Explain absorption loss. State types of absorption losses.
- (d) Explain the operation of OTDR.
- (e) "Optical communication uses optical switch." Explain the above statement with its working principle.

5. Attempt any TWO of the following :**12**

- (a) Explain SONET/SDH architecture with neat diagram.
- (b) State the function of following in satellite :
 - (i) Propulsion control
 - (ii) LNA
 - (iii) Altitude control
- (c) Explain how is geostationary orbit and geostationary satellite different from LEO.

6. Attempt any TWO of the following :**12**

- (a) State the reason for occurrence of following losses in satellite :
 - (i) Feeder losses
 - (ii) Antenna misalignment losses
 - (iii) Ionosphere losses
 - (b) State two distinguishing features of following standards :
 - (i) IEEE 802.3j
 - (ii) IEEE 802.3y
 - (iii) IEEE 802.3z
 - (c) Silica optical with core diameter large enough to be considered by ray theory analysis has core refractive index of 1.50 and cladding refractive index of 1.47. Calculate
 - (i) Critical angle
 - (ii) Numerical Aperture of fiber
 - (iii) Acceptance angle in air for fiber
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