22647

12223

3 Hours / 70 Marks Seat No. | | | | | | | | |

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.

2. Attempt any THREE of the following : **12**

(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
