22647

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

15 minutes extra for each hour

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

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

(a) State two advantages and two disadvantages of fiber optics cable.

(b) Define : (i) Critical Angle (ii) Acceptance Angle.

(c) List the types of optical splitters.

(d) State the specification of 802.3j (any 4).

(e) State reason for difference in uplink and downlink frequency in satellite communication.

(f) Define following terms w.r.t. satellite :
(i) footprint (ii) Elevation Angle.

(g) Define EIRP.

(h) List the different applications of satellite communication.

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

(a) Explain inter modal & intra modal dispersion in optical fibre with neat diagram.

(b) State the types of optical amplifier. Explain any one.

(c) Differentiate between LED and LASER (any eight points).

(d) Explain : Ethernet standards of optical network in detail.

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

(a) Define geostationary orbit and geostationary satellite and state advantages of geostationary orbit/satellite.

(b) Define optical switch. State its types.

(c) With neat sketch describe the operation of PIN photodiode.

(d) Draw block diagram of OTDR and explain its working.

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

(a) Describe absorption and coupling losses in optical fiber.

(b) Write uplink and downlink frequency for C-band, X-band, K_n-band and K_a-band.

(c) A fiber has a core diameter of 2 μm and its core R.T. is 1.43. The refractive index of cladding is 1.415. Determine : (i) numerical aperture (ii) critical angle (iii) Acceptance angle (iv) Relative refractive index difference.

(d) List different types of losses occurring in a satellite link and explain any one in detail.

(e) Draw the block diagram of telemetry tracking and command subsystem and state its principle of operation.

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

(a) Draw block diagram of fiber optic communication system and list out optical sources and detectors suitable for fiber optic communication.

(b) State different types of splicing technique. State in which technique electric arc is used for splicing the fibre & explain the method in detail with neat diagram.

(c) Explain SONET architecture with neat diagram.

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

(a) Draw the block diagram and explain the operation of GPS transmitter and GPS receiver.

(b) Describe the effect of non-spherical nature of earth on the orbital inclination of geosynchronous satellite.

(c) Explain working principle of VSAT and state its application.

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