

22647

12526

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 answer 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.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) Define Antenna look angle.
- b) Draw any four neat labelled sketch of a simple optical communication system.
- c) If the refractive indexes of the core and cladding of an optical fiber are 1.5 and 1.46 respectively. Find the critical angle.
- d) List the types of satellite transponders.
- e) Define any two parameters of orbits.
- f) Specify any two applications of optical Amplifiers.
- g) Enlist any two advantages of VSAT.

P.T.O.

- 2. Attempt any THREE of the following: 12**
- a) Describe the Kepler's first law and second law.
 - b) Explain the generation of LASER beam.
 - c) Draw and describe the block diagram of satellite earth station.
 - d) Describe the dispersion and scattering losses in optical fiber communications.
- 3. Attempt any THREE of the following: 12**
- a) Explain how avalanche photodiode is used as photo detector.
 - b) Comparison between LEO, MEO and GEO w.r.t. :-
 - i) Orbit height
 - ii) Time taken for one revolution
 - iii) Round trip delay
 - iv) Application.
 - c) Define optical network and state its need of optical splitter.
 - d) Describe the absorption losses in optical fiber.
- 4. Attempt any THREE of the following: 12**
- a) Draw and describe the single conversion transponder.
 - b) Describe the working of PIN photodiode.
 - c) Explain the working of OTDR.
 - d) Draw and describe construction of optical fiber cable.
 - e) Write the comparison of Ethernet standards of optical network w.r.t. :-
 - i) IEEE standard
 - ii) Data rate
 - iii) Topology
 - iv) Signaling.

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

- a) Describe :-
 - i) Geostationary Orbit
 - ii) Polar Orbit related to communication standards.
- b) Describe the Telemetry, Tracking and Command subsystem of satellite communication.
- c) Draw and describe SONET types of ring topology.

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

- a) Draw the block diagram of GPS transmitter and write detail of each block.
 - b) An optical fiber with refractive index of core 1.50 and the refractive index of cladding is 1.45. Calculate :
 - i) Critical angle QC
 - ii) Numerical aperture
 - iii) Acceptance angle
 - iv) Relative refractive index difference.
 - c) Discuss the importance of WDM in optical networks and lists its benefits.
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