

17472

21819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.

Marks

1. (A) Attempt any SIX :

12

- (a) List any four advantages of pulse modulation over AM.
- (b) Define :
 - (i) Footprint in satellite communication
 - (ii) Geostationary satellite
- (c) List the range of frequencies for Low Frequency Band (LF) and Very High Frequency Band (VF).
- (d) Draw NRZ and Manchester coded waveform for data 1 0 0 1 1 1 0 1.
- (e) Define network topology. List its types.
- (f) Define :
 - (i) Acceptance angle
 - (ii) Numerical aperture
- (g) List any two advantages of WDM.
- (h) State the need for modulation in electronic communication.

(B) Attempt any TWO :**8**

- (a) (i) Draw the waveforms of ASK, FSK for input 4 bit data 11000011.
- (a) (ii) Draw the constellation diagram for BPSK and QPSK.
- (b) Explain FDM with suitable block diagram.
- (c) An AM waveform is observed on CRO and the readings are $V_{\max} = 28 \text{ V}$,
 $V_{\min} = 12 \text{ V}$. Determine :
 - (i) % modulation index
 - (ii) Carrier amplitude

2. Attempt any FOUR :**16**

- (a) Draw the diagram for generation of PWM and write its working.
- (b) (i) What is the relation of carrier power and total power when percentage modulation index is 100% ?
- (b) (ii) What is the modulation index of an FM wave when carrier swing is 50 kHz and maximum modulating signal is 5 kHz ?
- (c) Write any one disadvantage of NRZ, polar RZ code. Write one advantage of Manchester and differential Manchester code.
- (d) State the working principle of transponder and draw its neat block diagram.
- (e) Explain frequency reuse concept. List its two advantages.
- (f) Compare AM and FM on the basis of
 - (i) Waveform
 - (ii) Modulation index
 - (iii) Carrier frequency range
 - (iv) Frequency spectrum

3. Attempt any FOUR :**16**

- (a) (i) State the sampling theorem.
- (a) (ii) State Nyquist criteria.
- (b) Draw the block diagram of delta modulation and adaptive delta modulation.
- (c) State the working principle of PIN photodiode. Draw its constructional diagram.
- (d) (i) List two advantages of TDMA.
- (d) (ii) Explain TDMA concept with diagram.
- (e) Draw well labelled signal flow diagram of mobile to wireline call procedure.
- (f) Why hexagonal cell structure is used in mobile communication ? Define co-channel interference and adjacent channel interference.

4. Attempt any FOUR :**16**

- (a) Draw the circuit diagram of AM diode detector and explain its working.
- (b) (i) List any two advantages of PCM.
- (b) (ii) List any two applications of PCM.
- (c) Write any two frequency bands with its uplink and downlink frequencies used in satellite communication.
- (d) State the classification of optical fiber on the basis of
 - (i) Index profile
 - (ii) Mode of propagation of light
- (e) Write any four electrical characteristics RS-232 standards.
- (f) Define handoff. Explain any one handoff technique.

5. Attempt any FOUR :**16**

- (a) Draw the block diagram of QPSK generation and explain its working.
- (b) Compare FSK and BPSK on following points :
 - (i) Definition
 - (ii) Output waveform for input 1011
 - (iii) Advantages
 - (iv) Application

P.T.O.

- (c) Draw the block diagram of downlink model in satellite communication.
Define :
- (i) Azimuth angle
 - (ii) Elevation angle
- (d) Draw the block diagram of Modem. List the classification of Modem.
- (e) State the function of – hub, repeater, router, bridge.
- (f) Draw the ring topology for six computers and explain its working.

6. Attempt any FOUR :

16

- (a) Draw the block diagram of PCM system.
- (b) Compare LED and Laser diode as source in FOC on following points :
- (i) Intensity of light
 - (ii) Directionality of radiation pattern
 - (iii) Basic principle
 - (iv) Application
- (c) Explain any four losses in optical fiber communication.
- (d) Draw OSI model. State the function of its third and last layer.
- (e) Explain the LAN with diagram.
- (f) State the following for FDMA and CDMA :
- (i) Principle used in multiple access method
 - (ii) Advantages
 - (iii) Disadvantages
 - (iv) Applications
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