17472

15162

3 Hours / 100 Marks Seat No. | | | | | | | | |

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.

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

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

Marks

1. (A) Attempt any SIX : **12**

(a) State sampling theorem.

(b) Define orbit with reference to satellite.

(c) Calculate modulation index for frequency modulated wave if frequency deviation is 75 KHz, modulation frequency is 5 KHz and carrier frequency is 100 MHz.

(d) Define multiplexing and state any two types of multiplexing techniques.

(e) State two advantages and two disadvantages of ring topology.

(f) Draw cross sectional diagram of graded index fiber and label it.

(g) Define unipolar RZ and NRZ encoding techniques with neat waveforms.

(h) Define Noise and Noise figure.

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

(a) Define with neat waveform BPSK and state two advantages of it over others.

(b) Show the Manchester and Alternative Mark Inversion (AMI) pattern for the bit stream – 01100011.

(c) Define Amplitude Modulation. Draw AM wave and state two applications of AM.

2. Attempt any FOUR : 16

(a) Draw the block diagram of generation of PPM and write its working principle.

(b) Draw frequency spectrum of AM wave if modulation frequency of 2 KHz with amplitude of 1 V is modulated with carrier frequency 600 KHz with amplitude of 2 V.

(c) Draw polar RZ, NRZ and unipolar RZ, NRZ pattern for bit stream – 11000110.

(d) Draw block diagram of satellite uplink model and state functions of up converter and power amplifier.

(e) Describe with neat diagram the procedure of Hand-off operation in mobile communication.

(f) Draw amplitude modulated waveform for the conditions

(i) m = 0%

(ii) m = 100%

(iii) m < 100%

(iv) m > 100%

3. Attempt any FOUR : 16

(a) Draw block diagram of PAM generator and state two advantages of PAM.

(b) Draw block diagram of PCM transmitter and state function of quantizer block in it.

(c) State operating principle of LED and list four specifications of LED.

(d) Draw block diagram of transponder and describe function of each block.

(e) Describe frequency reuse feature used in mobile communication with proper cell diagram.

(f) Define with proper structural diagram ‘cell’ and ‘cluster’ with reference to mobile communication.

4. Attempt any FOUR : **16**

(a) Calculate frequency swing and bandwidth of F.M. system using Carson's rule, if the maximum frequency deviation is 50 KHz and maximum modulating frequency is 5 KHz.

(b) Draw block diagram of BPSK generation and state function of each block.

(c) State different frequency bands used for satellite communication with their uplink and downlink frequencies.

(d) Define Acceptance angle and Numerical aperture with reference to optical fiber communication.

(e) Draw neat architecture of OSI model and state function of router in networking.

(f) Describe cell splitting technique with proper cell diagrams used in mobile communication.

5. Attempt any FOUR : **16**

(a) Compare PCM and DM on the basis of

(i) Number of bits per sample

(ii) Distortions/errors

(iii) Bandwidth

(iv) Feedback from output

(b) Draw BPSK and QPSK waveforms for bit sequence 11011000.

(c) With neat diagram describe CDMA and state two advantages of it.

(d) List different types of network connecting devices and state functions of repeaters, bridges.

(e) Describe digital signature with reference to network security.

(f) Compare LAN and WAN on the basis of

(i) Principle

(ii) Propagation delay

(iii) Bandwidth

(iv) Communication medium.

6. Attempt any FOUR : **16**

(a) What is slope overload distortion in DM ? How it is minimized in ADM ? Show with appropriate waveforms.

(b) Draw block diagram of fiber optic communication system and give two advantages.

(c) Describe losses in optical fiber due to bending.

(d) State any four network topologies with proper diagrams.

(e) Draw TCP/IP model and state function of any two layers.

(f) Distinguish between FDMA and CDMA on the basis of

(i) Bandwidth

(ii) Synchronization

(iii) Guard band

(iv) Interference

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