11920

3 Hours / 100 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.

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

Marks

1. **(A) Attempt any SIX of the following :**   **12**

(a) Write two advantages of pulse modulation over AM.

(b) Define geostationary satellite. Write one example of Indian Geostationary satellite.

(c) State the need for modulation in communication system.

(d) State two advantages of TDM and FDM.

(e) Draw the diagram of Bus topology and Ring topology.

(f) Draw the construction and characteristics of graded index optical fiber.

(g) Draw the unipolar RZ and NRZ waveform for the pattern 1001101.

(h) Define SNR and noise figure.

    (B)   **Attempt any TWO of the following :**   **8**

        (a)   Draw the waveforms of ASK, FSK, BPSK for the data 101101001.

        (b)   Draw the Manchester coded waveform for data 101101001 and write one advantages of Manchester coding and AMI coding.

        (c)   Draw Amplitude modulated wave. State modulation index and bandwidth.

2.   **Attempt any FOUR of the following :**   **16**

    (a)   Draw the block diagram of PWM and PPM.

    (b)   Compare AM and FM on the basis of (i) Wave form (ii) Bandwidth (iii) Modulation index and (iv) Carrier frequency range.

    (c)   Compare TDM, FDM and WDM.

    (d)   (i)   List any two frequency bands used in satellite communication.

          (ii)   State the values of frequency in uplink and downlink.

    (e)   State the sequence of mobile to landline call procedure.

    (f)   The carrier amplitude after AM varies between 4 volts and 1 volt. Calculate the modulation index.

3.   **Attempt any FOUR of the following :**   **16**

    (a)   State sampling theorem and Nyquist criteria.

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

    (c)   State operating principle of LASER as optical transmitter and write two specifications.

    (d)   Draw the diagram of transponder. Write the function of LNA.

    (e)   Draw the cell pattern for frequency reuse and state the advantages of frequency reuse.

    (f)   Define :

        (i)   Co-channel interference

        (ii) Adjacent channel interference.

4.   **Attempt any FOUR of the following :**   **16**

    (a)   In an FM system, if the maximum frequency deviation is 75 kHz and the maximum modulating frequency is 10 kHz. Calculate the deviation ratio and bandwidth of the system using Carson's rule.

    (b)   Describe the BPSK generation with neat block diagram.

    (c)   State the advantages of FDMA and disadvantages of CDMA.

    (d)   Write four advantages of optical fiber communication.

    (e)   Draw the pin diagram and necessary waveforms in 9-pin connector of RS-232.

    (f)   Define hand off Describe the soft hand off in mobile communication.

5.   **Attempt any FOUR of the following :**   **16**

    (a)   (i)   State two applications of PCM.

        (ii) State two disadvantages of PCM.

    (b)   Compare PCM and ADM on the basis of (i) No. of bits per sample (ii) Step size (iii) System complexity and (iv) Distortion.

    (c)   Define azimuth angle and elevation angle.

    (d)   State the function of (i) Modem (ii) Bridge (iii) Router and (iv) Repeater

    (e)   Describe : (i) Message integrity (ii) Message authentication

    (f)   Compare LAN and WAN.

6. **Attempt any FOUR of the following :** 16

    (a) (i) Draw the characteristics of companding process.

        (ii) Draw the waveform showing distortion in DM.

    (b) Describe the working of PIN diode as optical receiver.

    (c) State the losses in optical fiber.

    (d) (i) Draw the OSI model.

        (ii) Write the function of 3rd layer.

    (e) (i) Draw TCP/IP model.

        (ii) Write the function of 2nd layer.

    (f) Draw the different satellite orbits. Write the use of any one.

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