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

Marks

1. (a) Attempt any THREE of the following : **3 × 4 = 12**

(i) Draw AM wave in time domain and frequency domain.

(ii) Write the difference between AM and FM with respect to

(1) Definition

(2) No. of side bands

(3) Bandwidth

(4) Spectrum

(iii) Draw neat waveforms of QPSK for the input data 00101101.

(iv) List the types of multiplexing techniques. Explain Frequency Division Multiplexing (FDM) with block diagram.

(b) Attempt any ONE of the following : **1 × 6 = 6**

(i) List the types of wave propagation techniques. Explain Ground Wave Propagation.

(ii) Draw the block diagram of digital communication system and explain each block.

2. Attempt any FOUR of the following : **4 × 4 = 16**

(a) State the need of modulation.

(b) State the sampling theorem and Nyquist rate.

(c) State the bandwidth requirement for FSK, BPSK, QPSK and DPSK

(d) For a bit stream 11010100 encode using the following codes :–

(1) Polar RZ

(2) Unipolar NRZ

(3) Unipolar RZ

(4) AMI

(e) How the frequency is reused using frequency reuse technique.

(f) State the four applications of satellite communication system.

3. Attempt any FOUR of the following : **4 × 4 = 16**

(a) Draw the block diagram of generation of PWM. Describe working with waveform.

(b) Define Pulse Modulation. State the classification of pulse modulation techniques.

(c) Differentiate between AM and ASK. (any 4 points)

(d) Draw the block diagram of QPSK and explain its working principle.

(e) State the advantages and disadvantages of encoding technique.

(f) State the sequential steps for handset to handset call procedure.

4. (a) Solve any THREE of the following : **3 × 4 = 12**

(i) Draw block diagram of Low Level AM Transmitter. Describe the function of each block.

(ii) State the two advantages of FSK over ASK and PSK.

(iii) Compare Unipolar RZ and Unipolar NRZ encoding methods. (any 4 points)

(iv) Give any two applications of TDMA and FDMA.

(b) Attempt any ONE of the following : **1 × 6 = 6**

(i) Describe working of Pulse Code Modulation technique with neat block diagram and waveforms.

(ii) Draw and explain block diagram of Cellular mobile phone system.

5. Attempt any FOUR of the following : **4 × 4 = 16**

(a) Define the following terms :

(i) Modulation index of AM (m)

(ii) Modulation index of FM (mf)

(iii) Phase Modulation (PM)

(iv) Bandwidth

(b) Compare pulse modulation with continuous wave modulation. (any 4 points)

(c) State Shannon's theorem to measure channel capacity.

(d) Compare between baseband and passband transmission.

(e) Define Bit rate and Baud rate.

(f) Describe Handoff in mobile communication. Explain.

6. Attempt any FOUR of the following : **4 × 4 = 16**

(a) Find percentage modulation in AM when V_{max} = 132 V_{pp} and V_{min} = 28 V_{pp}.

(b) State advantages and limitations of Delta Modulation. Which technique will be used to avoid limitations of Delta Modulation ?

(c) Differentiate between PAM any PWM. (any 4 points)

(d) Draw the block diagram of FDMA and describe its working.

(e) Which frequency band is used for Satellite Communication ? Define Uplink and Downlink, with its frequencies.

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