23242

3 Hours / 70 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. Attempt any FIVE of the following : **5 × 2 = 10**

(a) State any two advantages and any two disadvantages of Digital Communication.

(b) State any four characteristics of Communication Channel.

(c) State Sampling theorem

(d) List different digital modulation techniques.

(e) State types of multiplexing technique.

(f) State the need of multiplexing.

(g) State application of speed spectrum modulation.

2. Attempt any THREE of the following : **3 × 4 = 12**

(a) Draw the basic block diagram of digital communication system. State the function of source encoder and channel encoder.

(b) Describe slope overload and granular noise in DM system with diagram.

(c) Describe natural sampling with neat sketch.

(d) Describe the working of BPSK transmitter using block diagram. Also draw its waveform.

3. Attempt any THREE of the following : **3 × 4 = 12**

(a) Generate CRC code for data word 1101101001 by using divisor as 1101. State two advantages of CRC method.

(b) Draw block diagram of DPCM transmitter and explain Roll of Predictor.

(c) Draw the block diagram of FDM system and state its advantages.

(d) Compare TDMA and CDMA on the basis of (1) Sharing of time and bandwidth (2) Synchronisation (3) Codeword (4) Guard band and guard time.

4. Attempt any THREE of the following : **3 × 4 = 12**

(a) State Hartley's law and Shannon Hartley's theorem.

(b) Describe the working of an ADM transmitter with neat block diagram.

(c) Describe synchronous time division multiplexing with neat diagram.

(d) Describe with the help of block diagram spread spectrum modulation system.

(e) Construct the hamming code for data 1010 with odd parity.

5. Attempt any TWO of the following : **2 × 6 = 12**

(a) Encode the following binary data stream 10100110 into

(1) Unipolar RZ

(2) Unipolar NRZ

(3) Polar RZ

(4) Polar NRZ

(5) AMI

(6) Polar quaternary

(b) Compare ASK, FSK, PSK modulation techniques (any six points)

(c) Draw the block diagram of PCM transmitter with the help of relevant waveform, explain its working.

6. Attempt any TWO of the following : **2 × 6 = 12**

(a) Describe the M-ary FSK encoding technique with neat block diagram and also draw constellation diagram of BPSK, QPSK.

(b) (i) Draw the neat block diagram of QAM system. State its types.

(ii) Draw the block diagram of DPSK transmitter.

(c) Differentiate between direct sequence spread spectrum and frequency hopped spread spectrum.