22428

21222

3 Hours / 70 Marks Seat No. | | | | | | | | |

15 minutes extra for each hour

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. Attempt any FIVE of the following : **10**

(a) Define the terms :

(i) Bit rate

(ii) Baud rate

(b) State Shannon Hartley theorem.

(c) State minimum sampling rate using Nyquist criteria.

(d) List the Digital Modulation Schemes.

(e) State the types of Multiplexing techniques.

(f) State the need of Multiplexing.

(g) Draw the neat block diagram of Direct Sequence Spread Spectrum transmitter.

2. Attempt any THREE of the following : **12**

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

(b) Describe the working of

(i) Quantizer and

(ii) Encoder, blocks of PCM generator.

Also draw the block diagram of PCM transmitter.

(c) Draw the block diagram of DM-transmitter. Explain its working in brief.

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

3. Attempt any THREE of the following : **12**

(a) Define and state the expression of

(i) Entropy (ii) Information rate

(b) Draw the block diagram of DPCM transmitter and explain its working.

(c) State the advantages and disadvantages of FDM system.

(d) Compare TDMA and CDMA on the basis of following points –

(a) Guard band (b) Guard time

(c) Codeword (d) Synchronization

4. Attempt any THREE of the following : **12**

(a) State the advantages of Digital communication.

(b) Explain the need of Companding.

(c) Explain Synchronous time-division multiplexing using block diagram.

(d) Differentiate the Direct sequence spread spectrum with frequency hopping spread spectrum techniques.

(e) Generate the Hamming code for the data (11001001) using even parity.

5. Attempt any TWO of the following : **12**

(a) Draw data format for the bit stream (11000110) :

(i) Manchester

(ii) Polar Quaternary

(iii) Bipolar RZ

(iv) Unipolar NR

(v) AMI

(vi) Unipolar NRZ

(b) Draw the (a) Block diagram of QAM transmitter (b) Constellation diagram of 8 QAM.

(c) Explain Slope overload and Granular noise in Delta Modulation. Also state the solution to reduce these effects.

6. Attempt any TWO of the following : **12**

(a) State the Bandwidth requirement of (i) BPSK (ii) BFSK (iii) QPSK

Explain the need of M-ary encoding. Draw the block diagram of M-ary FSK.

(b) Explain the generation of DPSK using block diagram and waveform.

(c) Generate the Pseudo-noise sequence by the feedback register shown in Fig.-1.

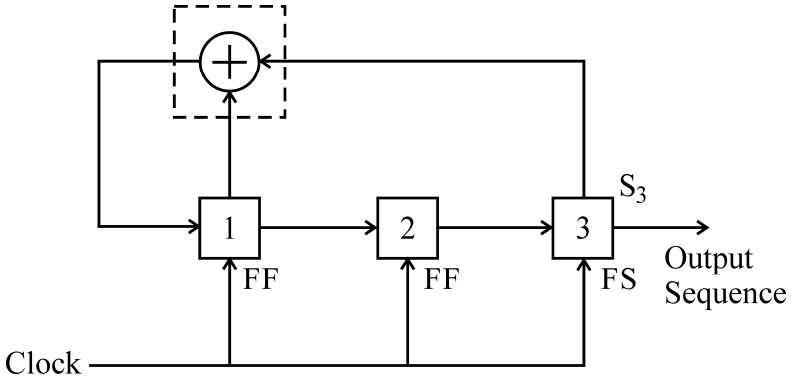

Fig. 1