22428

12526

3 Hours / 70 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) Assume suitable data, if necessary.

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

Marks

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

a) State Shannon Hastley's theorem for channel capacity.

b) List different types of multiplexing techniques.

c) Define –

i) Bit rate

ii) Baud rate

d) State different types of digital modulation technique.

e) List any two advantages and two disadvantages of CDMA system.

f) State different applications of spread spectrum modulation.

g) State the bandwidth requirement of –

i) BPSK

ii) BFSK

P.T.O.

Marks

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

a) Draw the block diagram of digital communication system and describe function of channel encoder and channel decoder.

b) Define FSK. Explain BFSK transmitter with proper waveforms and diagram.

c) Draw and describe the working of PCM transmitter.

d) Describe the working of BPSK transmitter using block diagram with proper waveforms.

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

a) Generate the Hamming code for the data 1011 using odd parity.

b) Explain the effect of aliasing with diagram. State the methods to eliminate it.

c) State different advantages and disadvantages of TDM system.

d) Compare FH-SS and DS-SS technique.

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

a) Draw and describe the working of DPCM transmitter.

b) Describe E and T carrier multiplexing hierarchy.

c) Explain synchronous time division multiplexing using block diagram.

d) Describe the working of CRC checker with example.

e) Compare FDMA and TDMA on the basis of –

i) Guard band

ii) Guard time

iii) Code word

iv) Synchronization

Marks

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

a) Draw and describe the block diagram of QAM transmitter and constellation diagram of 8-QAM.

b) Explain slope overload and granular noise in Delta modulation. How it will be elliminated ?

c) Draw data formate for the bit stream 10011011

i) Unipolar RZ

ii) Bipolar RZ

iii) AMI

iv) Split phase manchester

v) Differential Manchester

vi) Polar quaternary

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

a) Compare ASK, FSK and PSK any six points.

b) A discrete memory less sources has alphabet of 5 symbols with probabilities for its O/P as described in table.

Symbol	S_0	S_1	S_2	S_3	S_4
Probability	0.15	0.25	0.20	0.10	0.30

Find out the Huffman code for this source also calculate.

i) Average code word length

ii) Entropy of source

iii) Code efficiency

Marks

c) For the PN sequence generator shown in Fig. No. 1 obtain and draw the PN sequence. Assume initial contents of the shift register are 1001.

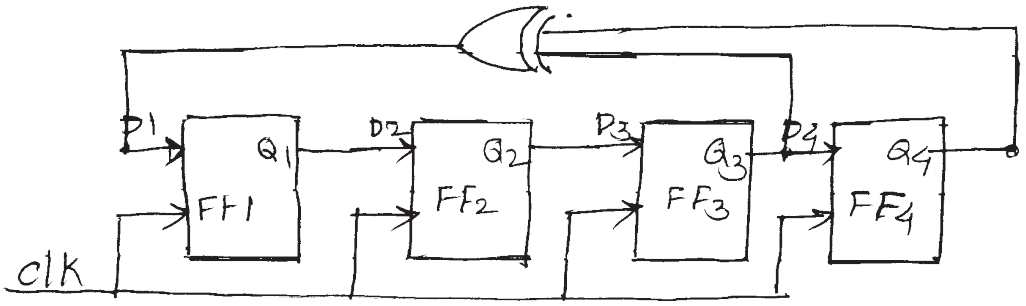

Fig. No. 1