

314326

12526

3 Hours / 70 Marks

Seat No.

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

Marks

1. Attempt any FIVE of the following : 10
- State Shannon Hartley's theorem.
 - Define the term entropy. State its formula.
 - Sketch neat i/p and o/p waveform for natural sampling.
 - List the various digital modulation schemes.
 - Sketch constellation diagram for QPSK and 8PSK.
 - Define multiplexing. State its types.
 - List any four applications of spread spectrum.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Draw the block diagram of digital communication system. State functions of source encoder and channel encoder.
 - b) State the need of multiple access. Explain difference between multiplexing and multiple access methods.
 - c) State and explain the distortions observed in DM system.
 - d) Explain the model of spread spectrum modulation system with neat diagram.
- 3. Attempt any THREE of the following :** **12**
- a) Describe FDM system with neat block diagram.
 - b) Define aliasing effect with neat diagram. State methods to eliminate the aliasing.
 - c) State bandwidth for the following digital modulation techniques – BASK, BFSK, BPSK, M-ary PSK.
 - d) Explain slow frequency hopping spread spectrum with neat diagram.
- 4. Attempt any THREE of the following :** **12**
- a) Describe the working of BPSK transmitter with neat block diagram and waveforms.
 - b) Compare ASK, FSK and PSK modulation techniques.
(Any four points)

- c) For the PN sequence generator shown in Fig. No. 1, obtain the PN sequence. Assume the initial outputs of shift register as

$$Q_3Q_2Q_1Q_0 = 1001$$

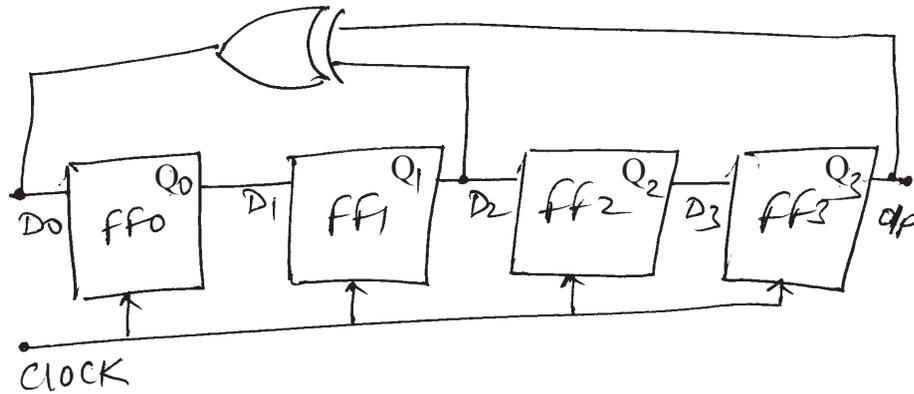


Fig. No. 1

- d) Compare DSSS and FHSS on the basis of following parameters
- Chip rate
 - Modulation
 - Processing gain
 - Acquisition time
- e) Construct Hamming code for the data 1100, with odd parity.

5. Attempt any TWO of the following :

12

- a) Encode the following binary data stream 10110100 into –
- Unipolar RZ
 - Unipolar NRZ
 - Bipolar RZ
 - AMI
 - Polar quaternary
 - Split Phase Manchester
- b) Define ASK. Explain block diagram of ASK generation with neat waveforms. State its bandwidth.

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Marks

- c) List any four error detection methods. Generate CRC codeword for binary data 1101101001, using divisor 1101. State two advantages of this method.

6. Attempt any TWO of the following :

12

- a) Explain the block diagram of DPCM transmitter. State two advantages and two disadvantages.
- b) Compare pulse modulation with continuous wave modulation (Any six points)
- c) Explain TDM with neat block diagram. Compare TDM and FDM. (Any three points)
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