

B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017

DIGITAL COMMUNICATION SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Compare amplifier and regenerative repeater.
 - List the drawbacks of DM.
 - Find matched filter for a rectangular pulse $g(t)$ of amplitude A and duration T .
 - Define Duo binary signaling. What are the disadvantages of it?
 - What is Schwarz inequality?
 - Draw the block diagram of correlation receiver.
 - Define bandwidth efficiency.
 - Draw signal space diagram of QPSK.
 - Verify that the given code $C = \{0\ 0\ 0, 1\ 1\ 1\}$ is linear code or not.
 - Show that the code $C = \{0\ 0\ 0, 1\ 0\ 0, 0\ 1\ 1, 1\ 1\ 1\}$ is not cyclic.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) State and prove sampling theorem.
(b) Compare PCM, DPCM & DM.

OR

- 3 (a) Draw and explain the block diagram of TDM.
(b) Explain operation of ADPCM system.

UNIT – II

- 4 (a) Explain inter symbol interference with required equations.
(b) What are the practical difficulties encountered with the ideal Nyquist channel and how to overcome them?

OR

- 5 (a) What are properties of matched filter?
(b) Explain how an eye pattern provides a great deal of useful information about the performance of a data transmission system.

UNIT – III

- 6 (a) Explain Gram-Schmidt orthogonalization procedure.
(b) Explain correlation receiver with neat block diagram briefly.

OR

- 7 Explain conversion of AWGN channel into vector channel.

UNIT – IV

- 8 Explain coherent generation and detection of BPSK signals and derive the expression for probability of error.

OR

- 9 (a) Explain non-coherent binary frequency shift keying.
(b) Explain generation and detection of DPSK signals.

Contd. in page 2

UNIT - V

- 10 (a) For a (6,3) systematic linear block code, the three parity check bits c_4 , c_5 and c_6 are formed from the following equations: $c_4 = d_1 \oplus d_3$
 $c_5 = d_1 \oplus d_2 \oplus d_3$
 $c_6 = d_1 \oplus d_2$
- (i) Write down the generator matrix G.
(ii) Construct all possible code words.
(iii) Suppose that the received word is 010111. Decode this received word by finding the location of the error and the transmitted data bits.
- (b) Consider a (7, 4) cyclic code with $g(x) = 1 + x + x^3$.
(i) Let data word $d = (1\ 0\ 1\ 0)$. Find the corresponding code word.
(ii) Let the code word $c = (11\ 0\ 0\ 1\ 0\ 1)$. Find the corresponding data word.

OR

- 11 Write a short notes on:
- (a) Error correction and detection codes.
(b) Automatic Retransmission Query (ARQ) Systems.
(c) Linear block codes.
(d) Convolutional codes.
