1058
B.E. (Electronics and Communication Engineering)
Sixth Semester
EC-603: Digital Communication

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

Q1. (a) Draw the entropy vs probability curve for binary discrete memoryless source.

(b) What do you mean by soft decision decoding?

(c) Plot BER vs SNR curve for BPSK modulation scheme.

(d) Draw two non sinusoidal orthogonal signals with time duration T.

(e) Calculate the capacity of Gaussian channel with bandwidth 10 MHz and SNR 1023.

(f) Explain two important communication resources.

(g) Define jamming margin in spread spectrum systems.

(h) Why pulse shaping is required for baseband data transmission?

(i) Draw the constellation diagram for 8-PSK.

(k) What is the use of syndrome in channel codes?   10 x 1=10

PART-A

Q2. (a) With suitable diagram explain modulation and demodulation in BPSK scheme.   6

(b) Compare PSK and QAM for probability of Error, Constellation diagram and applications.   .4

Q3. Three signals are defined as follows.

$$s_1(t) = \begin{cases} 2, 0 \le t \le 1 \\ 0, otherwise \end{cases}, \quad s_2(t) = \begin{cases} -4, 0 \le t \le 2 \\ 0, otherwise \end{cases}, \quad s_3(t) = \begin{cases} 3, 0 \le t \le 3 \\ 0, otherwise \end{cases}$$

Using Gram-Schmidt orthogonalization procedure, find a set of orthonormal basis functions to represent above three signals. Also express each of the given signal in terms of orthonormal functions.   10

Q4. (a) With suitable example, show the decoding of convolution codes.   7

(b) WrIte merits and demerits of convolution codes over block codes.

PART B

Q5.(a) Draw the block diagram of DSSS (Direct Sequence Spread Spectrum) communication system.

5

Explain the function of each block.

5

(b) Show the generation of maximum length PN code using 4 shift registers.

5

Q6. (a) Derive the expression of throughput for pure ALOHA system.

(b)Differentiate the following:

- Slow FHSS and Fast FHSS   3,2
- TDD and TDMA

Q7. (a) Draw the duo-binary signalling scheme. Illustrate the respective changes in rectangular pulse

6

shape.

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(b) What is ISI? How raised cosine signalling helps reducing ISI?

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