Sixth Semester B.E. Degree Examination, June/July 2017
Digital Communication

Time: 3 hrs.

Max. Marks:100

Note: 1. *Answer FIVE full questions, selecting*
at least TWO questions from each part.
2. *Missing data be suitably assumed.*
3. *Standard notations are used.*

PART – A

1 a. Define sampling theorem. Derive an expression for Fourier transform of discrete signals and discuss spectrum representation of the transform for under sampling, over sampling frequency and for nyquist rate. **(13 Marks)**

   b. Explain block diagram of digital communication system. **(07 Marks)**

2 a. Explain differential pulse code modulation with block diagram. **(08 Marks)**

   b. Define compression laws and companding gain. **(06 Marks)**

   c. Explain different signaling schemes used in A/D converter with example. **(06 Marks)**

3 a. Explain the process of reconstruction of a signal from discrete samples. Derive the equation necessary. **(08 Marks)**

   b. Explain inter symbol interference. **(06 Marks)**

   c. Explain time division multiplexing for T_1 carrier system. **(06 Marks)**

4 a. What is duobinary signaling scheme? Explain duobinary coding with precoder. **(10 Marks)**

   b. Explain base band M-ary PAM system. Derive an expression to analyse ISI. How to compensate it? **(10 Marks)**

PART – B

5 a. Derive an expression for probability of error of FSK scheme. **(14 Marks)**

   b. State the properties of PN sequence with example. **(06 Marks)**

6 a. Derive an expression for SNR of a matched filter impulse response and output of the matched filter. **(08 Marks)**

   b. Explain direct-sequence spread spectrum modulation and derive an expression for $(SNR)_0$ interms of processing gain. **(12 Marks)**

7 a. Explain maximum likelihood estimation. **(10 Marks)**

   b. Using Gram-Schmidt orthogonalization procedure, find a set of orthonormal basis functions for the given set of signals $S_1(t)$, $S_2(t)$ and $S_3(t)$ **(10 Marks)**
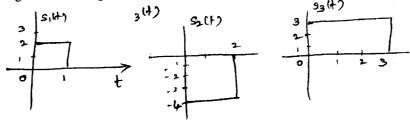

Fig. Q7 (b)

8 a. Draw the transmitter and receiver unit block diagram of a QPSK system. **(08 Marks)**

   b. Explain the process of detection of signals with unknown phase in noise. **(08 Marks)**

   c. Explain briefly DPSK. **(04 Marks)**

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