Sixth Semester B.E. Degree Examination, June/July 2016
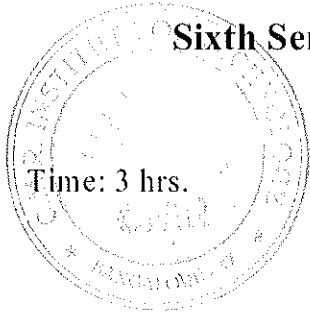
Digital Communication

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a. Explain in brief with a neat diagram a digital communication system and specify function of each block. **(10 Marks)**

 b. What do you mean by (i) natural sampling, (ii) flat-top sampling? Derive an expression for flat-top-sampled signal. **(10 Marks)**

2   a. With a neat block diagram, explain the PCM transmitter-receiver. Also explain the three basic operations in a regenerative repeater. **(10 Marks)**

 b. What is the necessity of non-uniform quantization? Explain the two companding methods used in practice. **(10 Marks)**

3   a. Explain with a neat block diagram how an optical fiber link is used for transmission of digital data. **(10 Marks)**

 b. What are the two types of quantization noises in Delta modulation? Explain with a neat sketch and equations. **(06 Marks)**

 c. A delta modulator is designed to operate 10 times the Nyquist rate for a signal with 10 kHz bandwidth. Determine the Max.SNR, for a 8 kHz input sinusoid assuming no slope overload error. **(04 Marks)**

4   a. Explain with a neat diagram the baseband binary data transmission with the concept of inter symbol interference. **(10 Marks)**

 b. Describe the Nyquist criterion for distortionless baseband transmission system. **(06 Marks)**

 c. Explain adaptive equalization for data transmission. **(04 Marks)**

PART – B

5   a. Explain the working of: i) coherent BPSK transmitter, ii) Coherent QAM transmitter. **(10 Marks)**

 b. Explain the coherent PSK receiver. Obtain the expression for probability of error for PSK with coherent receiver. **(10 Marks)**

6   a. Derive an expression for SNR of a matched filter, impulse response and output of the matched filter. **(12 Marks)**

 b. Explain in brief the properties of a matched filter. **(08 Marks)**

7   a. Define spread spectrum. Explain in brief with a neat diagram, generation of PN sequence using Max. length sequence generator. **(08 Marks)**

 b. What is frequency hop spread spectrum? Explain the operation of Fast-Frequency hopping transmitter. **(08 Marks)**

 c. Define the terms processing gain and jamming margin. **(04 Marks)**

8   Write short notes on any FOUR:

 a. Bandpass sampling   b. Duobinary signaling   c. Correlative coding

 d. Differential PSK   e. M-ary discrete PAM systems   **(20 Marks)**

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