

Total No. of Questions :10]

[Total No. of Printed Pages :3

Roll No .....

**EC - 503 (NGS)**

**B.E. V Semester**

Examination, December 2012

**Digital Communication**

(Non-Grading System Only)

*Time : Three Hours*

*Maximum Marks : 70/100*

- Note:** 1. Attempt one question from each unit.  
2. All questions carry equal marks.

**Unit - I**

1. a) Define the following with examples:
  - i) Cumulative Distribution Function
  - ii) Probability Density Function
  - iii) Variance
- b) Write and explain the central-limit theorem.

Or

2. (a) Describe the Gaussian Distribution with distribution function.
- (b) What is meant by probability of error? Derive the expression for probability of error.

[2]

**Unit - II**

3. a) Discuss sampling theorem. Explain the generation of sampled signal and how the original signal is recovered from a sampled signal.
- b) What is Pulse Amplitude Modulation (PAM)? Draw and explain the circuit of PAM modulator.

Or

4. a) Discuss flat-top sampling. What is aperture effect and how it could be overcome?
- b) What is time division multiplexing? Write short note on bandwidth requirements for TDM.

**Unit - III**

5. a) Explain quantization in detail. What is quantization error or quantization noise?
- b) Explain delta modulation with block diagram. What are its limitations and how are they overcome?

Or

6. a) What is compounding? Explain why compounding is needed? Discuss laws of compounding.
- b) Explain the working principle of adaptive delta modulation system. How it is different from delta modulation?

**Unit - IV**

7. a) What is meant by PSK? Draw and explain the block diagram of BPSK transmitter and receiver.

[3]

- b) Discuss the properties of the matched filter. What is the need of using the same?

Or

- 8. a) Explain the generation and detection of ASK with necessary diagrams.
- b) What is QAM? Explain the QAM transmitter and receiver with block diagram.

#### Unit - V

- 9. a) Explain spread spectrum modulation. How it can be used for communication purpose? Explain its advantages and disadvantages.
- b) What is CDMA? How does it employ spread spectrum techniques during the multiple access of the signals?

Or

- 10. a) Explain direct sequence spread spectrum with block diagram of transmitter and receiver.
- b) Write short note on 'acquisition and tracking of FH and DS signals.

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