

B. Tech. IV Sem. (Main) Exam., April-May 2017
Computer Science & Engineering
4CS5A Fundamental of Communication

Time : 3 Hours

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Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates :-

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used / calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT - I

1 (a) Explain the amplitude modulation.

6

(b) An amplitude modulated signal is given by

$$P_{AM}(t) = 10 \cos(2\pi \cdot 10^6 t) + 5 \cos(2\pi \cdot 10^6 t) \cos(2\pi \cdot 10^3 t) + 2 \cos(2\pi \cdot 10^6 t) \cos(4\pi \cdot 10^3 t) \text{ Volts}$$

Find the various frequency components present and the corresponding modulation index. Draw the Line Spectrum and find bandwidth.

6

- (c) Explain the difference between narrow band FM and wide band FM.

4

OR

- 1 (a) Define the following terms for FM waves :

- (i) Carrier swing
- (ii) Frequency deviation
- (iii) Percent modulation.

6

- (b) Explain Frequency Division Multiplexing (FDM).

6

- (c) Explain any generation method of frequency modulation.

4

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UNIT - II

- 2 (a) State and prove sampling theorem in time domain. What is aliasing effect and how it is reduced ?

8

- (b) Draw the circuit diagram of generation of PPM signal. Write the advantage of PPM.

8

OR

- 2 (a) Find Nyquist rate and the Nyquist interval for the signal.

$$x(t) = \frac{1}{2\pi} \cos(4000 \pi t) \cos(1000 \pi t).$$

8

- (b) Explain the Time division multiplexing with block diagram.

8

UNIT - III

- 3 (a) Describe the working of a Delta Modulation System. Compare the uniform and non-uniform quantization method. 8
- (b) Explain the quantization error and derive an expression for minimum signal to noise ratio in PCM system that uses linear quantization. 8

OR

- 3 (a) Explain Adaptive Delta Modulation in detail with suitable diagram. Also, explain the advantage of adaptive delta modulation over delta modulation. 8
- (b) Explain the slope overload distortion and granular noise in delta modulation and how it is removed in ADM. 8

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UNIT - IV

- 4 (a) Represent the data 10110100 using the following digital data formats with the help of neat figures :
(i) RZ
(ii) NRZ. 6
- (b) What is the Nyquist Criterion of zero ISI ? Explain. 4
- (c) Explain the generation method of PSK. 6

OR

- 4 (a) Explain the difference between different modulation techniques. 8
- (b) Draw the block diagram of QPSK system and explain its working. 8

UNIT - V

- 5 (a) Draw a block diagram to generate a PN signal. 8
- (b) What are the modulation techniques used in FHSS systems ? 8
- OR**
- 5 (a) What are the important applications of Spread Spectrum (SS) system ? 6
- (b) What is meant by spreading a signal ? 4
- (c) What are the modulation techniques used in DSSS systems ? 6