Roll No .....

CS/IT/EE - 405

B.E. IV Semester Examination, December 2014

Analog and Digital Communication

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

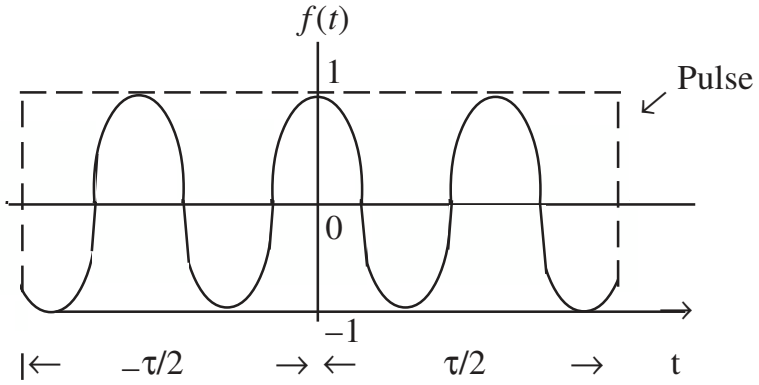
ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Explain causal and non causal system?
   b) What is correlation?
   c) What is Fourier transform? Explain different properties of Fourier transform.
   d) Find the Fourier transform of a radio frequency pulse.



OR

i) Explain Parseval's theorem for energy signal.

ii) What is the difference between power and energy signals.

Unit - II

2. a) What is the need of modulation?
   b) Explain significance of modulation index.
   c) compare DSB-SC, SSB and VSB?
   d) A carrier A cos w_{ct} is modulated by a modulating signal $f(t) = E_1 \cos w_1 t + E_2 \cos w_2 t + E_3 \cos w_3 t$. Derive expression for total modulated power and net modulation index.

OR

Draw and explain working of balance modulation? How we can demodulate this signals.

Unit - III

3. a) What is sampling theorem?
   b) Define baud and bit rate.
   c) Explain working of PCM system in short.
   d) Discuss the working of delta modulation? What are the limitation of it.

OR

Explain the following terms
i) Companding
ii) Eye patterns

Unit - IV

4. a) What is ASK?
   b) What is MODEM?
   c) Discuss the mathematical equation of BPSK?
   d) Explain the working of QAM? How we can generate it?

OR

Draw and explain QPSK modulator and demodulators.

Unit - V

5. a) What is entropy?
   b) Explain mutual information and channel capacity?
   c) Explain Shannon's theorem?
   d) Apply the Shannon-Fano coding procedure for the following message ensemble:

$[x] = [x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 \quad x_6 \quad x_7 \quad x_8]$

$[P] = [1/4 \quad 1/8 \quad 1/16 \quad 1/16 \quad 1/16 \quad 1/4 \quad 1/16 \quad 1/18]$

$M = 2.$

OR

Short notes (any two)
i) Manchester coding
ii) Cyclic codes
iii) BEC
iv) Minimum hamming distance

******