Roll No .....

CS/EE/IT-405

B.E. IV Semester

Examination, June 2016

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 question 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.

1. a) Write condition for existence of Fourier Transform.
   b) What is unit impulse function?
   c) Draw a gate function and find its Fourier Transform.
   d) The impulse response of a continuous time system is expressed as $h(t) = \frac{1}{RC} e^{-t/RC} u(t)$

   Find frequency a response and plot the magnitude phase plots.

   OR

   Write properties of Fourier Transform and explain.

2. a) What is the need for modulation?
   b) Define power content in AM wave.
   c) Compare AM and FM system.
   d) Explain phase shift method of SSB generation.

   OR

   Explain Ring modulator for DSB-SC generation.

3. a) Define Nyquist Rate and Nyquist Interval.
   b) What is Aliasing effect?
   c) Six message signal each of bandwidth 5kHz are time division multiplexed and transmitted. Determine the signalling rate and minimum channel bandwidth of the PAM/TDM channel.
   d) Explain demodulation of PWM signal.

   OR

   Compare Ideal, natural and flat-top sampling techniques.

4. a) Draw signal space diagram of ASK.
   b) Give advantages of DPSK over BPSK.
   c) Derive an expression of power spectral density of minimum shift keying.
   d) Explain generation of Quadrature phase shift keying (QPSK) with necessary waveforms.

   OR

   Compare BPSK, DPSK and QPSK.

5. a) Define mutual information.
   b) Define cyclic codes.
   c) Draw model of communication system and explain it.
   d) Obtain the generator matrix corresponding to $G(p) = p^3 + p + 1$ and find out code vectors for (7, 4) cyclic code.

   OR

   For a (7, 4) block code generated by [G] below, explain how the error syndrome helps in connecting a single error.

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$$

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