ANALOG COMMUNICATION SYSTEMS
(EC-301, Dec 2005)

Time: 3 Hrs   Max. Marks: 60

Note: Section A is compulsory. Attempt any four questions from Section B and any two from Section C.

Section-A
1. (a) Draw the circuit and explain pre-emphasis.
   (b) Derive the expression for depth of modulation if the amplitude modulation is displayed in an oscilloscope.
   (c) Compare AM and FM.
   (d) Draw the block diagram of "third method" of SSB generation.
   (e) Explain ISB.
   (f) Sketch the instantaneous frequency-time curve for a 100 MHz carrier wave frequency-modulated by a 1 kHz square wave, the peak deviation is 90 kHz.
   (g) A constant amplitude 2 kHz sine wave is used to phase-modulate a carrier. At some later time, the frequency of the modulating signal is increased to 5 kHz. Explain what happens to the output signal from a receiver used to receive the modulated wave.
   (h) Explain inter symbol cross talk.
   (i) With diagram explain flat-topped PAM sampling.
   (j) Find the bandwidth of an angle-modulated signal expressed as
   $$X_C(t) = 10\cos(2plO^8 t + 200\cos 2plO^3 t)$$

Section-B
2. (a) With the help of block diagram explain in detail a balanced modulator.
   (b) What is image rejection?
3. (a) Compare the three methods used for SSB generation.
   (b) Explain "Fidelity".
4. (a) What is the frequency deviation and carrier swing necessary to provide 75% modulation in the FM broadcast band?
   (b) Repeat for a FM signal serving as the audio portion of a TV broadcast.
5. Discuss a Foster Seeley discriminator in detail.
6. What is TDM? Discuss in detail.

Section-C
7. What are the different methods of F.M. Explain in detail Armstrong method of frequency modulation in detail?
8. Compare Super-heterodyne and double heterodyne receiver. What is a frequency synthesizer? Explain in detail an AM receiver using a phase locked loop (PLL).
9. Write short notes on
   (a) PPM
   (b) PWM
   (c) Sampling Theorem
   (d) Square Law Modulation.