Roll No. .....

EC–405

B. E. (Fourth Semester) EXAMINATION, Dec., 2011

(Electronics & Communication Engg. Branch)

ANALOG COMMUNICATION

(EC–405)

Time : Three Hours

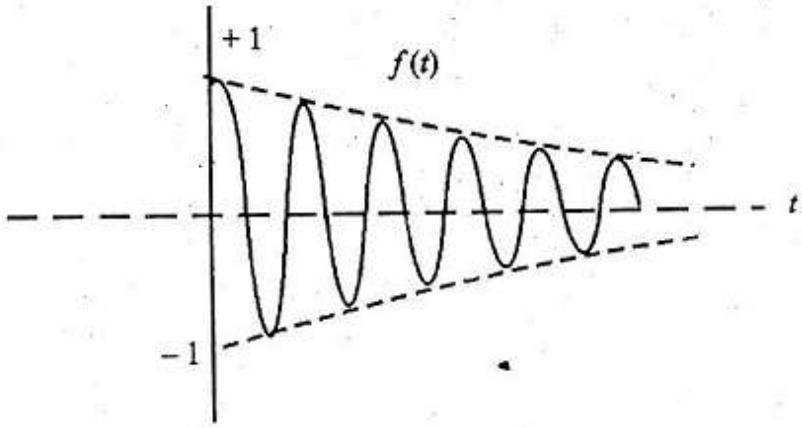
Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *one* question from each Unit. All questions carry equal marks.

Unit–I

1. (a) Find the Fourier transform of the waveform shown in Fig. Also draw the spectrum.



(b) Discuss the causality condition and physical realizability of a system.

Or

2. (a) Find the Fourier transform of a periodic train of triangular pulses with period T, base width of 2τ and altitude A.

   (b) State and prove Parseval's theorem for energy signals.

Unit – II

3. (a) Show that if every frequency component of a signal $f(t)$ is shifted by $\pi/2$, the resultant signal $f_h(t)$ is the Hilbert transform of $f(t)$.

   (b) Explain the different synchronising techniques used in synchronous detection.

Or

4. (a) An amplitude modulated wave $10[1 + 0{\cdot}6 \cos 2\pi 10^3 t] \cos 2\pi 10^6 t$ is to be detected by a linear diode detector. Find (i) The time constant τ (ii) The value of resistance R if the capacitor value i_c 100 pF.

   (b) Determine the expression of transmission efficiency of AM signal.

Unit – III

5. Analyse the wide band FM signals, restrict your analysis for signal tone FM system.

Or

6. (a) A carrier $A \cos \omega_c t$ is modulated by a signal $f(t) = 2 \cos 10^4 2\pi t + 5 \cos 10^3 \cdot 2\pi t + 3 \cos 10^4 4\pi t$.
   Find the bandwidth of the FM signal. Assume $k_f = 15 \times 10^3$ Hz/volt. Also find modulation index m_f.

   (b) Discuss the principle of working of Foster-Seely discriminator.

Unit – IV

7. (a) Explain the working of a low level radio transmitter.

   (b) Justify the selection of IF frequency.

Or

8. (a) Compare the superheterodyne receiver over TRF receiver.

   (b) With the help of a block diagram explain the working of FM receiver.

Unit – V

9. (a) Discuss about the noise form single and multiple noise source for linear system.

   (b) Determine the figure of merit of AM-SC-DSB signal.

Or

10. (a) Represent the band pass noise in terms of low pass.

    (b) Calculate the figure of merit of FM signal.