

Roll No

EC - 405
B.E. IV Semester
Examination, June 2013
Analog Communication

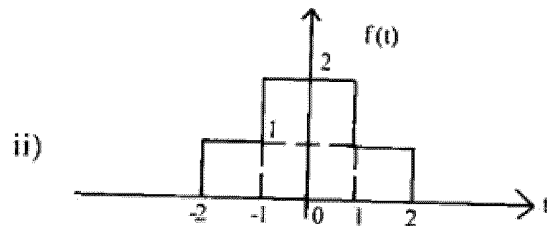
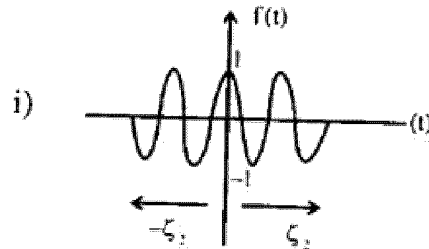
Time : Three Hours

Maximum Marks : 70/100

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

Unit - I

1. a) Find the Fourier transform of the following signals.



- b) Discuss about the Parseval's Power theorem.

OR

[2]

2. a) State and prove frequency shifting and time differentiation property of Fourier transform.
b) Show that unit impulse response of an ideal low pass filter is non casual.

Unit - II

3. a) Discuss the principle of operation of Costas receiver used for detecting AMSC signal.
b) Discuss the filter method for generation and detection of VSB signal.

OR

4. a) A carrier $A \cos \omega_c t$ is modulated by a single tone modulating signal $f(t) = E_m \cos \omega_m t$. Find
i) Total modulated power.
ii) rms value of the modulated signal.
iii) Transmission efficiency for a 100% modulation.
b) Discuss the demodulation of AM wave using square law detector.

Unit - III

5. a) A single tone modulating signal $\cos(15\pi \times 10^3 t)$ frequency modulates a carrier of 10MHz and produces a frequency deviation of 75 KHz. Find (i) the modulation index (ii) Phase deviation produced in the FM wave. (iii) If another modulating signal produces a modulation index of 100 while maintaining the same deviation, find the frequency and amplitude of the modulating signal $K_f = 15\text{KHz per volt}$.
b) Discuss the principle working of FM modulation circuit using varactor diode.

[3]

OR

6. a) A modulating signal $5 \cos 2\pi 15 \times 10^3 t$, angle modulates a carrier $A \cos \omega_c t$.
- i) Find the modulation index and bandwidth for FM and PM system.
 - ii) Determine the change in the bandwidth and the modulation index for both FM and PM if f_m is reduced to 5 KHz.
- b) Discuss the principle working of Ratio detector.

Unit - IV

7. Discuss the following :
- a) High level AM transmitter.
 - b) Diversity reception

OR

8. Explain the following :
- a) SSB transmitter
 - b) Super heterodyne receiver

Unit - V

9. Discuss the noise from single and multiple noise source for linear systems.

OR

10. Calculate the noise figure and noise temperature for cascaded systems.

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