

Total No. of Questions : 10] [Total No. of Printed Pages : 4

Roll No.

EC-405(N)

B. E. (Fourth Semester) EXAMINATION, June, 2010
(New Scheme)

(Electronics & Communication Engg. Branch)

ANALOG COMMUNICATION

[EC-405(N)]

Time : Three Hours

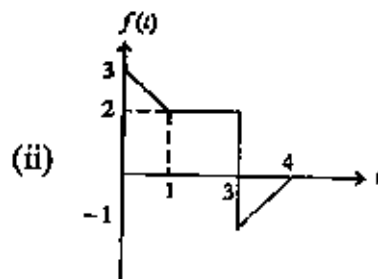
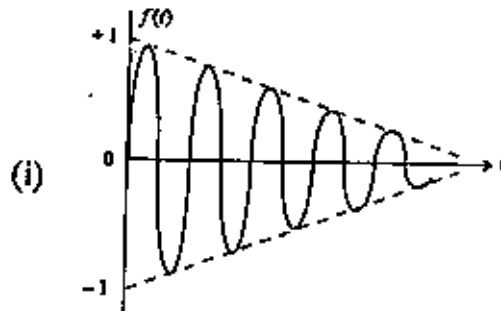
Maximum Marks : 100

Minimum Pass Marks : 35

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

Unit-I

1. (a) Determine the Fourier transform of the following :



P. T. O.

- (b) Show that the normalised Gaussian pulse is its own Fourier transform.

Or

2. (a) For a low pass filter, show that the rise time is inversely proportional to the system bandwidth.
(b) Determine the expression of power density spectrum of a periodic function $f(t)$ with period T .

Unit—II

3. (a) Discuss the phase discrimination method for generation of SSB-SC signals.
(b) The carrier $A \cos \omega_c t$ is modulated by a single tone modulating signal $f(t) = E_m \cos \omega_m t$. Find the total modulated power, r. m. s. value of the modulated signal and transmission efficiency for a 100% modulation.

Or

4. Explain the demodulation of AM wave using a linear diode detector. Justify the choice optimum value of time constant RC .

Unit—III

5. (a) A carrier wave $A \cos \omega_c t$ is frequency modulated by a single tone modulated signal $f(t) = E_m \cos \omega_m t$:
(i) Find the expression of FM wave.
(ii) Also find the expression for a narrow band FM.
(b) 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 the bandwidth for F. M. and P. M. system.

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- (ii) Determine the change in the bandwidth and the modulation index for both FM and PM, if f_m is reduced to 5 kHz.

Or

6. (a) Discuss the Armstrong method of FM signal generation.
(b) Explain Ratio detector used for demodulating FM signal.

Unit – IV

7. (a) With the help of a block diagram explain the AM transmitter using high level modulation.
(b) How and why is frequency multiplication applied to FM signals ?

Or

8. (a) Explain how Tracking and Alignment is achieved in AM radio receiver. Also discuss why local oscillator frequency is always kept higher than the signal frequency.
(b) With the help of circuit diagram AVC in radio receiver.

Unit – V

9. Show that the figure of merit of the DSB-SC system is the same as SSB-SC.

Or

10. (a) Obtain the figure of merit for the FM system.

P. T. O.

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- (b) A single tone modulating signal $E_m \cos \omega_m t$, frequency modulates a carrier $A \cos \omega_c t$. Show that :
- (i) The detector output signal to noise ratio is proportional to the square of bandwidth of FM signal.
 - (ii) The figure of merit Y is given by $\left(\frac{3}{2}\right) m_f^2$.