Code: R7220406



B.Tech II Year II Semester (R07) Supplementary Examinations, April/May 2013 ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions All questions carry equal marks

- 1 (a) Derive an expression for the power content and transmission efficiency of single tone modulated signal.
 - (b) A carrier Acos $\omega_c t$ is modulated by a modulating signal $f(t) = E_1 \cos \omega_1 t + E_2 \cos \omega_2 t + E_3 \cos \omega_3 t$. Then derive expression for: (i) Total modulated power (ii) Not modulation index of the amplitude modulated wave
 - (i) Total modulated power. (ii) Net modulation index of the amplitude modulated wave.
- 2 (a) Draw the circuit diagram for balanced ring modulator. Explain its operation indicating all the waveforms of the modulator.
 - (b) Derive the expression and draw the DSB-SC wave if both modulating signal and carrier are sinusoidal.
- 3 (a) Define Hilbert transform. What are the properties and applications of the Hilbert transform?
 - (b) Explain about envelope detection of VSB wave.
- 4 (a) Derive expression for the single tone narrow band frequency modulated wave.
 - (b) What are the principle merits and limitations of the FM?
- 5 (a) Derive the expression for the figure of merit for DSBSC receiver.
 - (b) Explain the idealized characteristics of band pass filtered noise.
- 6 (a) Explain the working principle of typical directly modulated FM transmitter with the help of neat block diagram.
 - (b) Explain the function of each block in the AM transmitter with the help of neat diagram.
- 7 (a) In a broad cast super heterodyne receiver having no RF amplifier, the loaded Q of the antenna coupling circuit, at the input to the mixer is 80. If the intermediate frequency is 455 KHz, calculate the image frequency and its rejection ratio at 1000 KHz.
 - (b) What is image frequency and how it is rejected?
- 8 (a) For a pulse amplitude modulated transmission of voice signal having maximum frequency equal to 3 KHz, calculate the transmission bandwidth. It is given that the sampling frequency is 8 KHz and the pulse duration 0.1 times its sampling period.
 - (b) What is pulse position modulation? How it is modulated and demodulated?
