

Code: R7220406

R7

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 $A \cos \omega_c t$ 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) 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?
