R09

B.Tech III Year I Semester (R09) Regular & Supplementary Examinations December 2014
ANALOG COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) What are the applications of modulation? Explain in detail.
 b) (What are the applications of coding methods? Explain in detail.

2 (a) Draw and explain the band pass signal and spectrum.
   (b) The antenna current of an AM transmitter is 9 A when only the carrier is sent, but it increases to 10.6 A when the carrier is modulated by a single sine wave. Find the percentage modulation. Determine the antenna current when the percentage of modulation changes to 0.8

3   Write short notes on:
   (a) Spectrum of VSB.
   (b) Synchronous detection.
   (c) Frequency discrimination method of AMSSB – SC generation.

4 (a) Give the expression for FM signal and expand the expression in terms of Bessel functions.
   (b) Find the carrier and modulating frequencies, the modulation index, and the maximum frequency deviation of the FM wave represented by the voltage equation $V = 18 \sin(6 \times 10^8 t + 5 \cos 1500 t)$. What power will this FM wave dissipate in a 25 ohm resistor?

5 (a) Explain the generation FM using direct method.
   (b) Compare slope detector and balanced slope detector.

6 (a) Discuss about Separately Excited Mixer.
   (b) In a broadcast super heterodyne receiver having no RF amplifier, the loaded Q of the antenna coupling circuit is 100. If the Intermediate frequency is 455 kHz, calculate (i) The image frequency and its rejection ratio at 1 MHz. (ii) The image frequency and its rejection ratio at 25 MHz.

7 (a) Explain about the sources of thermal noise.
   (b) Obtain the expression for output SNR of AMDSB-SC system.

8   What sampling rate would be appropriate for each of the following?
        (i) A telephone channel limited to 3.3 kHz bandwidth
        (ii) A Music channel with a maximum signal frequency of 20 kHz
        (iii) A television video channel with a maximum bandwidth of 5 MHz

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