R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech III Year I Semester Examinations, February/March - 2016
ANALOG COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

Part- A

                                                                                                    (25 Marks)

1.a)   As related to AM, what is over modulation, under modulation and 100%   modulation.
                                                                                                    [2]
  b)   Determine the depth of the modulation for AM transmitter which radiates 9kW without
       modulation and 10.125kW after modulation.   [3]
  c)   Give the advantages for Single sideband suppressed-carrier modulation.   [2]
  d)   Give the methods of generating SSB-SC-AM. And mention some applications of
       SSBSC**.**   [3]
  e)   Define the modulation indices of FM and PM.   [2]
  f)   Give the comparisons between AM and FM.   [3]
  g)   What is signal-to-noise ratio.   [2]
  h)   How to achieve threshold reduction in FM receiver.   [3]
  i)   Explain why some of the information signal is lost during pulse modulation.   [2]
  j)   Write a note on amplitude limiting.   [3]

Part-B

                                                                                                    (50 Marks)
2.   Explain the generation of AM signals using square law modulator.   [10]
                                                OR
3.   Discus the coherent detection of DSB-SC modulated wave with a block diagram of
      detector and Explain.   [10]

4.   Draw the block diagram for the generation and demodulation of a VSB signal and
      explain the principle of operation.   [10]
                                                OR
5.   In a coherent detection if carrier applied is $\cos(2\pi f_c t + \phi)$ prove that there is a phase
      error in the output and output consists not only the message signal but also its Hilbert
      transform.   [10]

6.   With a neat block diagram explain the generation of narrow band and wide band FM.
                                                                                 [10]
                                                OR
7.   Derive the expression for the spectrum of a FM signal with single tone modulation.
                                                                                 [10]

8. Draw the block diagram of FM demodulator and explain the effect of noise in detail and compare the performance of AM and FM in the presence of noise. [10]

OR

9. With a neat block diagram explain the pre-emphasis and de-emphasis in FM. [10]

10. Draw the block diagram of a super heterodyne receiver and explain its operation? What are the advantages of this receiver? [10]

OR

11. What is Automatic Gain Controlling radio receiver? What are the different types of AGC, explain in detail? [10]

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