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Code No: 135SA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, January/February - 2023
ANALOG COMMUNICATIONS
(Electronics and Communication Engineering)

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

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Define Modulating, Carrier and Modulated Signals. [2]
b) A Radio transmitter radiates 10 KW and carrier power is 8.5 KW. Calculate modulation index. [3]
c) List the properties of Hilbert Transform. [2]
d) Compare SSB and VSB. [3]
e) Define constant average power. [2]
f) Compare the FM and AM. [3]
g) What is meant by Noise? What are different sources of it? [2]
h) Explain how noise can be calculated in a communication system. [3]
i) Define sensitivity and selectivity. [2]
j) Explain the image frequency rejection of a radio receiver. [3]

PART – B

(50 Marks)

2.a) With the help of waveforms and spectrum, describe the concept of Amplitude modulation both in time domain and frequency domain.
b) Describe the coherent detection of DSB-SB modulated waves. [5+5]

OR

3.a) Explain the working of envelope detector with a neat circuit diagram.
b) Compare the ring modulator and balance modulator. [6+4]

4. Describe the SSB in frequency domain and then explain how to generate SSB modulated wave using frequency discrimination method. Also, list the advantages of SSB. [10]

OR

5.a) What is vestigial side band? Explain the process of generation and detection of VSB modulated wave using a carrier $A_c \cos 2\pi f_c t$.
b) Comparison of AM Techniques. [6+4]

6.a) Discuss the detection of FM wave using zero crossing detector.
b) Explain how FM signal is detected with the help of PLLs. [5+5]

OR

7. Formulate the equation for FM wave. Define modulation index, maximum deviation and band width of a FM signal. [10]

8. With the help of a neat diagram, explain the noise performance of DSB -SC scheme. [10]

OR

9.a) Derive the Noise Figure for cascade stages.
b) Derive the equation for Noise figure of merit for Amplitude modulation with single tone signal. [5+5]

10. Draw the block diagram of Superhetrodyne receiver and explain the function of each block and how it overcomes the limitations of TRF receiver. [10]

OR

11.a) Describe the generation and demodulation of PPM with the help of block diagram.
b) Draw the block diagram of FM receiver and explain each block, briefly. [5+5]

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