

R16

Code No: 134AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, September/October - 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) What is Amplitude modulation? Define the modulation index of an AM. [2]
- b) Regarding AM, what is over modulation, under modulation and 100% modulation? [3]
- c) What are the advantages of SSBSC over DSBSC, AM? [2]
- d) What is Hilbert transform and what are its applications? [3]
- e) Give the comparisons between AM and FM. [2]
- f) Draw the Phasor diagram of narrow band FM. [3]
- g) What is thermal noise? [2]
- h) Write the properties of narrow band noise. [3]
- i) List the different types of receivers. [2]
- j) Explain the need for an amplitude limiter in the FM receiver. [3]

PART – B

(50 Marks)

2. Explain the generation of the DSB-SC signal with the help of a balanced modulator using diodes. [10]
- OR**
3. Develop the equation of a single-tone modulation of the AM system and explain the power relations. [10]
 4. Describe the VSB in the time domain and then explain any one method of generating VSB modulated wave. [10]
- OR**
5. Explain the Frequency discrimination method for generating SSB signal. [10]

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- 6.a) A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is: (i) 1 kHz (ii) 15 kHz.

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- b) Explain the spectrum analysis of sinusoidal FM wave with neat diagrams. [4+6]

OR

7. What are the different types of generation of FM? Explain any two methods. [10]

8. Derive the expression of the figure of merit for the frequency-modulated system. [10]

OR

- 9.a) Explain the threshold effect in the angle modulation system.

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- b) Derive equation for Average Noise figure of cascaded networks. [5+5]

- 10.a) Explain the operation of a Tuned Radio Frequency (TRF) receiver with the block diagram and mention its advantages and disadvantages.

- b) What is AGC? Why it is needed in receivers. [6+4]

OR

11. Explain the generation and demodulation of PAM signals. [10]

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