# Code No: 134AC JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B.Tech II Year II Semester Examinations, December - 2018 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)	Define analog Modulation and also, list different types of analog modulations.	[2]
b)	Define Modulating Signal, Carrier and Modulated Signals.	[3]
c)	What is Guard band?	[2]
d)	Compare SSB and VSB.	[3]
e)	List the disadvantages of FM over AM.	[2]
f)	In an FM system, if m <sub>f</sub> is doubled by halving the modulating frequency, what	will be the
	effect on the maximum deviation?	[3]
g)	What is threshold effect?	[2]
h)	What is pre-emphasis? Why is it used?	[3]
i)	Illustrate Single and double polarity PAM wave.	[2]
j)	Define Sensitivity, Selectivity and image frequency.	[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) With necessary circuit diagram and waveforms, explain how DSB-SC wave is generated using:
  i) Balance Modulators and

ii) Ring Modulator.

- b) When a broadcast AM transmitter is 50 percent modulated, its antenna current is 12 A. What will be current when the modulation depth is increased to 0.9? [8+2]
- 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) Describe the VSB in time domain and then explain any one method of generating VSB modulated wave.
  - b) Give the applications of AM-FC and VSB modulation schemes. [6+4]

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6.a) Discuss the detection of FM wave using zero crossing detector.	5.a)	Discuss the	detection	of FM	wave using	zero crossing	detector.
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b) Discuss the generation of FM wave using direct method.

#### OR

[5+5]

[5+5]

- 7.a) Analyze Sinusoidal FM wave with the help of its spectrum.
- b) Explain how FM signal is detected with the help of PLLs. [5+5]
- 8.a) Derive the Noise Figure for cascade stages.
- b) What is thermal noise? Derive the expression for the thermal noise voltage across a resistor. [6+4]

#### OR

- 9.a) Discuss the noise performance of AM system using envelope detection.
  - b) Draw the Phasor representation of FM noise.
- 10.a) Of all the frequencies that must be rejected by a superheterodyne receiver, why is the image frequency so important? What is the image frequency and how does it arise? If the image-frequency rejection of a receiver is insufficient, what steps could be taken to improve it?
  - b) Define and distinguish between PTM and PAM schemes. [6+4]

#### 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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