Code No: 115AK

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, March - 2017
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)	Write the expression for amplitude modulated wave.	[2]
b)	What are the methods for detecting AM waves?	[3]
c)	Draw the frequency domain representation of SSB modulated wave.	[2]
d)	Compare different AM techniques.	[3]
e)	Define modulation index for FM.	[2]
f)	Differentiate FM and AM.	[3]
g)	What are the different types of noise sources in analog communication?	[2]
h)	How do you define the effective noise temperature?	[3]
i)	What are image frequencies? Explain.	[2]
j)	What is the need for AGC circuit?	[3]

PART - B

(50 Marks)

2.a) Derive the relation between the output power of an AM transmission and the depth of modulation.

 b) When the modulation percentage is 75, an AM transmitter produces 10KW. How much of this is carrier power. What would be the percentage power saving if the carrier and one of the side bands were suppressed?   [5+5]

OR

3.a) Draw the circuit diagram for balanced ring modulator and explain its operation indicating all the waveforms of the modulator.

 b) What is the effect of frequency and phase error in demodulation of DSB-SC wave using synchronous detector.   [5+5]

4.a) Discuss various methods used to generate SSB signals with neat sketches.

 b) Explain the need of VSB modulation.   [5+5]

OR

5. Describe the time domain band-pass representation of VSB. Draw and explain the block diagram of VSB generation corresponding to the time domain description.   [10]

6.a) Derive the expression for FM signal from fundamentals and differentiate narrow band FM and wide band FM.
  b) Explain the principle of direct method of generation of FM signal using relevant diagrams. [5+5]

OR

7. Prove that narrow band FM offers no improvement in SNR over AM. [10]

8.a) Derive the equation for noise figure of FM receiver.
  b) What is the purpose of pre-emphasis and de-emphasis filtering? Explain the filtering process with suitable sketches. [5+5]

OR

9. Compare noise performance of PM and FM system. [10]

10.a) Explain the working of tuned radio frequency receiver with the help of a block diagram.
   b) Give the comparison between phase discriminator and ratio detector. [5+5]

OR

11.a) Explain with a neat block diagram PPM generation and detection.
   b) Write short notes on time division multiplexing. [5+5]

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