Code: 13A04404

R13

B.Tech II Year II Semester (R13) Regular Examinations May/June 2015

ANALOG COMMUNICATION SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Define modulation index for AM?

(b) A 400W carrier is modulated to a depth of 75%. Calculate the total power in the modulated wave.

(c) What is Costas Loop?

(d) Define Carson's rule.

(e) State sampling theorem.

(f) What is a limiter?

(g) What is the advantage of PPM over PWM and PAM?

(h) Define Nyquist rate.

(i) Define channel capacity.

(j) Define the average source information rate.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 (a) With the help of circuit diagram explain the operation of rectifier detector for AM.

(b) Explain the working principle of nonlinear DSB-SC modulator with neat block diagram.

OR

3 (a) Draw the circuit diagram of Ring modulator and explain about it.

(b) Explain the concepts of Carrier Acquisition in DSB-SC.

UNIT – II

4 (a) Draw the block diagram of Armstrong method of WBFM generation and explain it.

(b) 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

OR

5 (a) Describe zero crossing detector and phase locked loop.

(b) Write short note on Pre-Emphasis and De-Emphasis circuits.

UNIT – III

6 (a) Calculate the noise figure for a SSB-SC system.

(b) Explain the noise performance of FM systems.

OR

7 (a) Explain the noise performance of DSB-SC scheme with the help of neat block diagram.

(b) Compare and contrast AM and FM.

UNIT – IV

8 (a) Explain natural and flat-top sampling. Compare the two.

(b) Define selectivity and fidelity.

OR

9 (a) What are the differences between PAM, PWM and PPM?

(b) Explain how PPM can be generated from PWM signals.

UNIT – V

10 (a) A black and white TV picture consists of 2×10^6 picture elements and 16 different brightness levels. Pictures are repeated at the rate of 32 per second. All picture elements are assumed to be independent, and all levels have equal likelihood of occurrence. Calculate the average rate of information conveyed by a TV set to a viewer.

(b) Write a short note on channel capacity of a Discrete memory less channel.

OR

11 (a) A source puts out one of five possible messages during each message interval. The probabilities of these messages are 1/2,1/4,1/8 &1/8. Find information.

(b) Write short note on measure of information and entropy.

*****