B.Tech. (Sem. - 5th)

ANALOG COMMUNICATION SYSTEMS

SUBJECT CODE : EC - 301

Paper ID : [A0311]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours   Maximum Marks : 60

Instruction to Candidates:

1) Section - A is **Compulsory**.

2) Attempt any **Four** questions from Section - B.

3) Attempt any **Two** questions from Section - C.

Section - A

Q1) $(10 \times 2 = 20)$

a) State whether practical information signal is power signal or energy signal.

b) What is the advantage of vestigial side band over SSB?

c) Draw the block diagram for generation of PM signal using FM modulator.

d) A 400 watts carrier is modulated to a depth of 75 percent. Find the total power in the AM wave. Assume that the modulating is sinusoidal.

e) With the increase in the modulation index, the increase in the effective bandwidth of FM signal is --------(less/more/roughly same) as compared to that of PM signal.

f) Ring modulator is used for the generation of -------- AM signal.

g) State the sampling theorem.

h) State, whether sample and hold circuit is used with Natural PAM or Flat-top PAM?

i) Narrow band FM signal is used for ----------.

j) Given an angle-modulated signal

$10 \cos [(10^8) \Pi t + 5 \sin 2\Pi (10^3) t]$

Determine the maximum frequency deviation.

Section - B

Q2) Explain the high level method of AM signal generation.

Q3) Explain the operation of square law detector.

Q4) Why AGC is used? Explain its working.

Q5) Explain the operation of single side band envelope detection receiver.

Q6) Give comparison between DSB-SC AM signal and DSB reduced carrier AM signal based on power contents, advantages/disadvantages in case of detection.

Section - C

$(2 \times 10 = 20)$

Q7) Explain the phase-locked-loop Direct FM Transmitter. How PLL makes the direct FM signal generation more effective.

Q8) Explain the operation of ratio detector.

Q9) What are the various pulse modulation schemes. Explain and compare these schemes.

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