Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE) (Sem.–5)

ANALOG COMMUNICATION SYSTEM

Subject Code : EC-301

Paper ID : [A0311]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1. Answer briefly :

a) Draw AM modulated wave and write formulas of modulation index.

b) Write the basic difference between SSB and VSB modulation.

c) Define the terms Double spotting and selectivity.

d) In AM wave a SSB signal contains 2KW.How much power is contained in the side band and how much is the carrier frequency?

e) In a Broad cast system, the maximum audio frequency transmitted from a radio station is of the order of 5 KHz .Calculate the size of the antenna,if signal is transmitted without modulation.

f) A receiver has an equivalent noise figure of 2 dB. Calculate its equivalent noise temperature.

g) Why Noise immunity of PWM is better than that of PAM?

h) Define Pre-emphasis and write its formula.

i) Why do we need to use the discrete PAM formats?

j) What do you mean by tracking and alignment in superheterodyne receiver?

SECTION-B

Q2. a) Explain with derivation the phase shift method of SSB generation.

b) Derive the relation between PM and FM.

Q3. If mf = mp = 20KHz, and a base band Modulating signal

$v_m = 5 \times cos\ 2\ \Pi \times 15 \times 10^3 t$ angle modulates a carrier signal $v_c\ cos\ \omega_c t$. Determine the modulation index and band width for a) FM system b)PM system c) Determine the modulation index and band width, if modulating frequency is reduced to l0KHz.

Q4. Give comparison of pulse analog modulation methods PAM, PWM and PPM.

Q5. Explain Bipolar transistor additive mixer and self-exited additive mixers of AM receiver.

Q6. In an FM system a 7KHz modulating signal modulates 107.8MHz carrier wave with frequency deviation of 50KHz. Determine modulation index and carrier swing in FM signal. What are the highest and lowest frequencies attained by the FM signal?

SECTION-C

Q7 Draw power spectrum of AM wave and calculate its power and current. An AM transmitter radiates 9KW of power, when the carrier is unmodulated and 10.125KW when carrier is sinusoidally modulated. Find the modulation index, percentage of modulation. Now if another sine wave corresponding to 40% modulation is transmitted simultaneously, then calculate the total radiated power.

Q8 a) Compare FDM and TDM methods of multiplexing.

b) How you can obtain SSB signal from DSB-SC signal? Justify your answer by phase shift method of SSB generation.

Q9. Write notes on following :

a) FM stereo transmitter and receiver

b) AM receiver using phase locked loop