TE Sem V (C Scheme R-2019) "ECS" May'2023

3/5/2023

Duration: 3hrs

[Max Marks:80]

N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR [20]

a Explain the need for modulation?

b What is AGC? Explain the different types of AGC?

c Explain the term signal to noise ratio. Also define Noise figure.

d State sampling theorem & explain its significance.

e Draw & explain the transmitter block diagram of BFSK system.

2 a An AM transmitter radiates 9 kW of power when the carrier is unmodulated and 10.125 kW when the carrier is sinusoidally modulated. Find the modulation index & percentage of modulation. Now, if another sinewave, corresponding to 40 percent modulation is transmitted simultaneously, then calculate the total radiated power. [10]

b What are the different types of SSB generation methods? Explain any one with block diagram in detail. [10]

3 a Draw & explain the balanced modulator circuit for DSBSC wave generation. [10]

b Compare Frequency modulation with phase modulation. [05]

c Explain the desirable properties of line codes. [05]

4 a Explain the following terms w.r.t radio receivers. [10]
(a) Sensitivity (b) Selectivity (c) Image frequency rejection ratio (d) Double spotting

b Draw PCM transmitter & receiver block diagram. Also explain each block in detail. [10]

5 a Draw & explain superheterodyne receiver with block diagram. Also draw the waveforms at the output of each block. [10]

b What is Pre-Emphasis & De-emphasis? Explain. [05]

c What is multiplexing? Explain frequency division multiplexing. [05]

6 a Compare BPSK, BASK & BFSK modulation techniques. [10]

b Explain generation & detection of QPSK modulation technique with neat diagram and waveforms. Also plot PSD of the modulated signal. [10]