TE Sem - V (ECS) R-19

(3 Hours) [Total 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 Compare Amplitude modulation & Frequency modulation
b For AM receiver with Intermediate Frequency of 455 KHz, tuned at signal frequency of 1000 KHz, determine image frequency, and image-rejection ratio for Q=100.
c Explain Inter-symbol Interference (ISI).
d Write a note on different types of noise in communication.
e Draw & explain the transmitter block diagram of BFSK system.

2 a An AM modulator modulates modulating signal of 25kHz,10Vp with carrier signal of 800 kHz, 40Vp. Calculate:
(i) Upper & lower sideband frequencies
(ii) Modulation coefficient and percentage modulation
(iii) Draw output frequency spectrum
(iv) Draw the envelope & label it [10]
b Explain the phase shift method of SSB generation with block diagram. [10]

3 a Draw & explain the balanced modulator circuit for DSBSC wave generation. [10]
b A 100MHz carrier signal is frequency modulated by analog modulating signal. The maximum frequency deviation is 100KHz. Determine the approximate transmission bandwidth of FM signal using Carson's bandwidth rule if the frequency of modulating signal is (a) 1KHz (b) 500KHz [05]
c Write a note on Duo-Binary Encoding. [05]

4 a Explain the following terms w.r.t radio receivers.
(i) Sensitivity (ii) Selectivity
(iii) Image frequency rejection ratio (iv) Double spotting [10]
b Draw neat diagram & explain in detail
(i) PCM transmitter
(ii) Delta modulator [10]

5 a Draw & explain superheterodyne receiver with block diagram. Also draw the waveforms at output of each block. [10]
b What is Pre-Emphasis & De-emphasis? Explain. [05]
c Compare TDM & FDM. [05]

6 a Explain generation & detection of QPSK modulation technique with neat diagram and waveforms. Aso plot PSD of the modulated signal. [10]
b Draw & explain the 16-QAM receiver block diagram. [10]