

1078
B.E. (Electrical and Electronics Engineering)
Fifth Semester
EE-507: Communication Engineering

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

- Q.No.1 (i) What is the envelope of AM wave?
(ii) Define modulation index for FM.
(iii) What is natural sampling?
(iv) Write a short note on slope overload distortion.
(v) What do you mean by coherent digital modulation techniques? (5x2=10)

Part - A

Q.No.2 (a) What is DSB-SC signal? What are the various methods of generation of a DSB-SC signal? Explain in detail the demodulation of DSB-SC signals. (6)

(b) A 3500 Hz audio tone amplitude modulates a 200 KHz carrier resulting in a modulated signal having a percent modulation of 85%. The total power being transmitted is 15 KW.

- (i) What frequencies would appear in a spectrum analysis of the modulated wave?
(ii) Determine the power content at each of the frequencies that appear in a spectrum analysis of the modulated wave. (4)

Q.No.3 (a) Write down the relationship between FM and PM signals. What are the various types of FM signal? Explain in detail the generation of narrowband FM signal. (6)

(b) The maximum deviation allowed in an FM broadcast system is 75 KHz. If the modulating signal is a single tone sinusoid of 8 KHz, determine the bandwidth of FM signal. What will be the bandwidth when modulating signal amplitude is doubled? (4)

Q.No.4 (a) Draw the block diagram of a superheterodyne receiver and explain the function of each block. (5)

(b) In regard to superheterodyne receiver, explain the following terms:

- (i) Sensitivity (ii) Selectivity (iii) Double Spotting (iv) Image frequency and its rejection. (5)

Part -B

Q.No.5 (a) What do you mean by PPM signal? Explain how a PPM signal can be generated and also explain the demodulation of PPM signal. List some advantages and disadvantages of PPM signal. (8)

(b) A television signal having a bandwidth of 4.2 MHz is transmitted using binary PCM system. Given that the number of quantization levels is 512. Determine:

- (i) Code word length (ii) Transmission bandwidth (2)

Q.No.6 (a) With the help of block diagram and waveforms, explain the generation and reception of QPSK system. (7)

(b) Explain the principle of BFSK system? (3)

Q.No.7 (a) Explain delta modulation in detail with suitable diagram. Also, explain adaptive delta modulation and compare its performance with delta modulation. (8)

(b) What is granular noise in delta modulation systems? (2)

x-x-x