1079

Exam.Code:0935
Sub. Code: 6983

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. I which is compulsory and selecting two questions from each Part.

x-x-x

Q.No.1 (i) Define transmission efficiency in an AM wave.

(ii) Define selectivity of a receiver.

(iii) What is carson's rule?

(iv) What is threshold effect in an envelope detector?

(v) What is natural sampling?

(vi) Define pulse code modulation scheme.

(vii) Explain the principle of BPSK.

(viii) What are the types of quantization?

(ix) Define companding.

(x) Write down the equation of SSB-SC signals.

(10x1=10)

Part - A

Q.No.2 (a) What is DSB-SC signal? Explain envelope detection after suitable carrier re-insertion method for DSB-SC signals. (5)

(b) An AM signal contains 500 W at its carrier frequency and 100 W in each of its sidebands.

(i) Determine the percent modulation of the AM signal.

(ii) Find the allocation of power if the percent modulation is changed to 60 %. (5)

Q.No.3 (a) Draw the circuit of RF amplifier used in a superheterodyne receiver and explain its working. (5)

(b) For a broadcast superheterodyne AM receiver having no RF amplifier, the loaded quality factor of the antenna coupling circuit is 100. Now if the intermediate frequency is 455 kHz, then determine the following :

(i) The image frequency and its rejection ratio at an incoming frequency of 1000 kHz.

(ii) The image frequency and its rejection ratio at an incoming frequency of 25 MHz. (5)

Q. No.4 (a) What do you mean by frequency discriminator circuits? Explain in detail PLL-FM detection method for FM signals. (5)

P.T.O.

(b) Determine the carrier swing, the highest and the lowest frequencies attained and the modulation index of the FM signal generated by frequency modulating a 101.6 MHz carrier with an 8 kHz sine wave causing a frequency deviation of 40 kHz. (5)

Part -B

Q.No.5 (a) What do you mean by PWM signals? Explain how a PWM signal can be generated and with the help of waveforms, explain the demodulation of PWM signal. (6)

(b) A signal having bandwidth equal to 3.5 kHz is sampled, quantized and coded by a PCM system. The coded signal is then transmitted over a transmission channel of supporting a transmission rate of 50 k bits/sec. Determine the maximum signal to noise ratio that can be obtained by this system. The input signal has peak to peak value of 4 volts and rms value of 0.2 V. (4)

Q.No.6 (a) Explain adaptive delta modulation in detail and also explain how the slope overload distortion is overcome in adaptive delta modulation technique? (6)

(b) A delta modulator system is designed to operate at five times the nyquist rate for a signal having a bandwidth equal to 3 KHz bandwidth. Calculate the maximum amplitude of a 2 KHz input sinusoid for which the delta modulator does not have slope overload. Given that the quantizing step size is 250 mV. (4)

Q.No.7 (a) What do you mean by BPSK technique? Write down the equation of BPSK system. How a BPSK signal is generated? Also explain the recovery of original binary signal from the BPSK signal. (6)

(b) Derive the relations for signalling rate and transmission bandwidth in PCM systems. (4)

x-x-x