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B.E. / B.Tech. (Part Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

ELECTRONICS AND COMMUNICATIONS ENGINEERING BRANCH

THIRD SEMESTER

PTEC9253 – COMMUNICATION SYSTEMS

Time: 3 hr (REGULATIONS 2009) Max Mark: 100

Answer ALL Questions

Part – A (10 X 2 = 20 Marks)

1. A 400-Watt carrier is modulated to a depth of 75 percent. Calculate the total power in the modulated wave.
2. What is vestigial sideband Modulation? Draw its spectrum.
3. An Amplifier operating over the frequency range from 18 to 20 MHz, has a 10K Ω input resistor. What is the rms noise voltage at the input to this amplifier if the ambient temperature is 27°C?
4. Define shot noise.
5. state Quantization error?
6. List the advantages of Pulse code modulation technique.
7. What is ISI? Name a technique to reduce ISI.
8. Draw the signal-space diagram for coherent binary FSK system.
9. What is the function of Pre-emphasis and de-emphasis circuit?
10. Draw the noisy receiver model and sketch the idealized characteristic of band -pass filtered noise.

Part – B (5 X 16 = 80 Marks)

11. (i). With neat diagram, explain the operation of Balanced Modulator circuit and derive its output . (8)
    (ii). Describe the Indirect method generating frequency Modulation technique, with the help of block diagram . (8)

12. (a). (i). With suitable sketch, explain the functions of superheterodyne receiver? (8)
    (ii). Discuss the External noises related to the receiver in detail. (8)

(or)

(b). (i). Discuss the Noise in a Reactive circuits with relevant diagram. (8)
(ii). Derive the Expression of Noise temperature. (8)

13. (a). Draw the Block diagram of PCM modulator and demodulator and Explain each Block in detail.

(or)

(b). Explain the Time Division Multiplexing and frequency Division Multiplexing in detail.

14. (a). Describe the generation and detection of DPSK in detail.

(or)

(b). (i). Discuss how coherent detection is used in optimal reception of FSK . (10)

(ii). A BPSK signal is received at the input of a coherent optimal receiver with amplitude 10mV and frequency 1MHz. The signal is corrupted with white noise of PSD 10^{-9} W/Hz. If data rate is 10^4 bits/sec, find error probability, find the error probability if the local oscillator has a phase shift of $\pi/6$ radian with input signal, find error Probability if there is 10% mistiming in bit synchronization while sampling. (6)

15.(a). Discuss the noise in FM receivers and derive the figure of merit with relevant diagrams.

(or)

(b). Explain FM threshold effect and FM threshold reduction in detail