4E1222

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4E1222

B. Tech. IV-Sem. (Back) Exam., Oct.-Nov. - 2020
Electronic Inst. & Control Engg.
4EI4-07 Analog and Digital Communication
EC, EI

Time: 2 Hours **Maximum Marks: 82**

Min. Passing Marks: 29

Instructions to Candidates:

Attempt all ten questions from Part A, four questions out of seven questions from Part B and two questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[10×2=20]**

All questions are compulsory

Q.1 What do you mean by Modulation Index? Define.

Q.2 Draw the circuit diagram of VSB Modulation.

Q.3 Differentiate AM, FM and PM. (Write basic four differences)

Q.4 What do you mean by Pre-emphasis and De-emphasis?

Q.5 What is Nyquist criteria?

Q.6 What are the needs for modulation?

Q.7 What are the limitations of frequency modulation?

Q.8 What do you mean by quantization?

Q.9 What are the basic components of a communication system?

Q.10 What are digital modulation tradeoffs?

PART – B

(Analytical/Problem solving questions) **[4×8=32]**

Attempt any four questions

Q.1 A 20 watts carrier is modulated to a depth of 65%. Calculate –

(i) The total power in AM and

(ii) The side band power

Q.2 Explain ASK modulator with block diagram. List the advantages of FSK.

Q.3 Explain Foster –Seeley discrimination with block diagram.

Q.4 Describe the coding and decoding of a PCM signal

Q.5 Explain frequency division multiplexing.

Q.6 Define phase modulation. Explain the need for DSB-SC and SSB modulation.

Q.7 Explain the process of demodulation with enyelop detector in AM receiver.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[2×15=30]**

Attempt any two questions

Q.1 *Define Binary FSK and explain about the generation and detection of binary FSK signals using block diagram.*

Q.2 Describe frequency discrimination method of generating SSB modulated wave and a method to demodulate it. What are the design issues involved in this method of generation? What is the cause and effect of phase error in demodulated signal?

Q.3 (i) A BPSK modulator with a carries frequency of 70 MHz and an input bit rate of 10 Mbps, determine the following –

(1) Maximum and minimum upper and lower side frequencies.

(2) Minimum Nyquist bandwidth and

(3) Band Rate

(ii) With a block diagram, explain the working of coherent binary FSK transmitter and receiver.

Q.4 (i) Compare the bit error rate performance for PSK, DPSK and FSK.

(ii) With the help of an example, explain Viterbi convolutional decoding algorithm.

Q.5 (i) Explain the generation of PCM signal with the help of a block diagram.

(ii) Explain about various operations performed in the transmitter and receiver of PCM system.
