

Reg. No.

Question Paper Code

11995

13 JUL 2023

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Fourth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20EIPC402 - PRINCIPLES OF COMMUNICATION ENGINEERING

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|--|-------------------------------|
| 1. State Carson's rule for Bandwidth of FM wave. | 2,K1,CO1 |
| 2. Compare FM and PM. | 2,K2,CO1 |
| 3. State Sampling theorem for band limited signal of finite energy. | 2,K1,CO2 |
| 4. What is line coding? List the types. | 2,K1,CO2 |
| 5. Draw the modulated waveform representing PSK for binary input "11000011". | 2,K1,CO3 |
| 6. Define Bit Rate. | 2,K1,CO3 |
| 7. Define Hamming weight and minimum distance. | 2,K1,CO4 |
| 8. Express the term measure of information. | 2,K2,CO4 |
| 9. What are PN sequences? | 2,K1,CO5 |
| 10. What are the advantages of spread spectrum techniques? | 2,K1,CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

- | | |
|---|-----------|
| 11. a) Discuss the disadvantages of TRF receiver and explain the working of Super heterodyne receiver with neat block diagram and its advantages. | 13,K2,CO1 |
| OR | |
| b) Explain the working of Foster Seeley discriminator in detail. | 13,K2,CO1 |
| 12. a) Explain the working of the ADM system and elaborate how noise is reduced in ADM system. | 13,K2,CO2 |
| OR | |
| b) Summarize the types of multiplexing techniques with neat diagrams. | 13,K2,CO2 |
| 13. a) Discuss the operation of a QPSK modulator and demodulator with a neat diagram. Draw its Phasor and constellation diagram. | 13,K2,CO3 |

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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OR

- b) With a neat diagram, explain in detail the Transmitter and Receiver section of 8-QAM along with a truth table, phasor diagram and constellation diagram. 13,K2,CO3
14. a) Using Shanon Fano coding encode the following symbol with probabilities $P=(0.0625,0.25,0.125,0.25,0.125,0.0625)$ and calculate the Average code word length, entropy of the source and coding efficiency. 13,K3,CO4

OR

- b) (i) Explain the generation of (n, k) blocks codes and how block codes can be used for error control? 13,K2,CO4
(ii) Explain the syndrome decoder for cyclic codes.
15. a) Describe Time division multiple access technique in detail. 13,K2,CO5

OR

- b) Illustrate the concept of the FHSS and DSSS communication system with suitable diagrams. 13,K2,CO5

PART - C (1 × 15 = 15 Marks)

16. a) Compare Amplitude modulation and Frequency modulation in detail. 15,K2,CO1

OR

- b) For the given parity check matrix of $(7,4)$ linear block code
- (i) Find the generator matrix(G) 3,K3,CO4
- (ii) List all the code vectors 9,K3,CO4
- (iii) How many errors can be detected? How many errors can be corrected? 3,K3,CO4

$$[H] = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$