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Question Paper Code	12793
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

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

	Marks	K- Level	CO
1. Draw the frequency spectrum and mention the bandwidth of AM signal.	2	K2	CO1
2. State Carson's rule.	2	K1	CO1
3. List the four predominant methods of pulse modulation.	2	K1	CO2
4. How can aliasing be avoided?	2	K1	CO2
5. Compare binary PSK with QPSK.	2	K2	CO3
6. Define inter symbol interference.	2	K1	CO3
7. Point out the term code efficiency.	2	K2	CO4
8. Define channel capacity of discrete memory less channel.	2	K1	CO4
9. Mention the spread spectrum techniques.	2	K1	CO5
10. What is processing gain in spread spectrum modulation?	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) With the help of neat block diagram explain about the generation of SSBSC wave and demodulation.	13	K2	CO1
OR			
b) With the help of neat block diagram explain the functioning of super heterodyne receiver.	13	K2	CO1
12. a) i) List the types of sampling. Explain the operation of the sample and hold circuit.	7	K2	CO2
ii) Describe the basic principles of PCM system and PCM transmitter.	6	K2	CO2
OR			
b) Explain with the neat block diagram of Delta Modulator (DM) and explain its working.	13	K2	CO2

13. a) Write a note on QPSK modulator & demodulator. Draw its phasor diagram. Explain bandwidth consideration of QPSK. 13 K2 CO3
- OR**
- b) i) With neat block diagram explain M-ary PSK receiver. 7 K2 CO3
 ii) Compare M-ary modulation schemes. 6 K2 CO3
14. a) Observe the Shannon-Fano coding for the probabilities $S = \{0.4, 0.2, 0.1, 0.1, 0.1, 0.1\}$. Identify Average code word length, entropy of the source, code efficiency and redundancy. 13 K3 CO4
- OR**
- b) Explain how Viterbi decoding procedure is used for decoding convolutional codes. 13 K2 CO4
15. a) i) Describe the frequency hopping spread spectrum technique in detail. 7 K2 CO5
 ii) Explain the near- far problem in spread spectrum modulation. 6 K2 CO5
- OR**
- b) i) Explain any two multiple access techniques in detail. 7 K2 CO5
 ii) Compare TDMA and CDMA. 6 K2 CO5

PART - C (1× 15 = 15 Marks)

16. a) The generator polynomial of (15,11) Hamming code is given by $1+X+X^2$. Determine encoder and syndrome calculator for this code using systematic codes. 15 K3 CO4
- OR**
- b) Explain the concept of spread spectrum communication system with suitable diagrams. 15 K2 CO5