

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	Marks	K-Level	CO
1. What happens to the carrier in Double Sideband Suppressed Carrier (DSBSC) modulation: (a) Amplified (b) Suppressed (c) Modulated (d) Transmitted with the sidebands	1	K1	CO1
2. Recall which types of modulation Vestigial Sideband (VSB) is a compromise between: (a) AM and FM (b) DSBSC and SSBSC (c) PAM and PCM (d) Frequency modulation and phase modulation	1	K1	CO1
3. State the first step performed on a signal in Pulse Code Modulation (PCM): (a) Quantized (b) Encoded (c) Sampled (d) Modulated	1	K1	CO2
4. Compare Pulse Amplitude Modulation (PAM) and Pulse Code Modulation (PCM) with respect to their bandwidth requirements: (a) PAM has higher bandwidth requirements than PCM (b) PCM has higher bandwidth requirements than PAM (c) PAM and PCM require the same bandwidth (d) Both PAM and PCM have no bandwidth requirements	1	K2	CO2
5. The primary purpose of cosine filters: (a) Pulse shaping (b) Demodulation (c) Error correction (d) Equalization	1	K1	CO3
6. Classify the types of Phase Shift Keying (PSK): (a) ASK, FSK, PSK (b) BPSK, DPSK, QPSK (c) FSK, QAM, BPSK (d) QAM, DPSK, PCM	1	K2	CO3
7. Recognize the basis of LZ coding: (a) Predictive coding (b) Dictionary-based compression (c) Arithmetic coding (d) Error detection	1	K1	CO4
8. Classify the types of source coding techniques: (a) Lossless and lossy (b) Huffman and cyclic (c) Convolutional and linear (d) Predictive and block	1	K2	CO4
9. State how users are assigned resources in TDMA: (a) Frequency bands (b) Time slots (c) Code sequences (d) Power levels	1	K1	CO5
10. Outline the steps in FHSS signal generation: (a) Use a PN sequence to switch frequencies rapidly (b) Encode data using phase shifts (c) Spread the signal using cosine filters (d) Assign each user a time slot	1	K2	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. Define modulation. And how they are classified?	2	K1	CO1
12. State the difference between SSB and VSB transmission systems.	2	K1	CO1
13. Compare FM and PM.	2	K2	CO1
14. What is aliasing?	2	K1	CO2
15. List the types of PAM.	2	K1	CO2
16. How granular noise in Delta modulation is reduced?	2	K1	CO2
17. Tabulate the difference between ASK, FSK and PSK.	2	K1	CO3
18. Define Bit Rate.	2	K1	CO3
19. Summarize the features of syndrome calculation.	2	K2	CO4
20. State the principle of hamming code.	2	K1	CO4

21. Mention the applications of CDMA. 2 K2 CO5
 22. Mention the uses of spread spectrum. 2 K1 CO5

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23. a) Explain in detail about FM generation using indirect method. 11 K2 CO1
OR
 b) Describe any two methods of generation of SSB-SC signals. 11 K2 CO1
24. a) Explain the working of PAM modulator for natural PAM and flat top PAM. 11 K2 CO2
OR
 b) With the neat block diagram of Adaptive Delta Modulator (ADM) and explain its working. 11 K2 CO2
25. a) Explain the operation of a QPSK modulator with a neat diagram. Draw its phasor and constellation diagram. 11 K2 CO3
OR
 b) Explain with a neat diagram how the BPSK signal is generated and detected? List its advantages and disadvantages. 11 K2 CO3
26. a) Using Huffman code encode the following symbol, $S = \{0.3, 0.2, 0.25, 0.12, 0.05, 0.08\}$, Identify (i) Average code word length (ii) entropy of the source (iii) code efficiency (iv) redundancy. 11 K2 CO4
OR
 b) Describe the steps involved in the generation of linear block codes. Define and explain properties of syndrome. 11 K2 CO4
27. a) Describe the Frequency division multiple access technique in detail. 11 K2 CO5
OR
 b) Illustrate the concept of the FHSS and DSSS communication system with suitable diagrams. 11 K2 CO5
28. a) (i) Describe the advantages of Error control codes. 6 K2 CO4
 (ii) Explain the PN sequences and their properties. 5 K2 CO5
OR
 b) (i) Explain the properties of syndrome 6 K2 CO4
 (ii) Illustrate the advantages of spread spectrum? 5 K2 CO5