

Subject Title: Digital Communication

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Unit - I: Signal analysis

1. Write short notes on complex fourier spectrum.
2. What is fourier transform and how fourier transform are used in real time applications, explain with examples.
3. State and prove the properties of fourier transform.
4. State and prove sampling theorem.
5. Define noise. Explain the various types of external and internal noise.
6. Define cross correlation and auto correlation and discuss their properties.
7. Explain the concept of PSD of a random process and derive the relation between PSD and power and PSD
8. State and prove the properties of power spectral density.
9. What are advantages and disadvantages of fourier transform?
10. Write in brief about random signals.
11. Define correlation of a signal.
12. Define fourier transform and give the formula for fourier and inverse fourier transform of a signal.
13. Explain the concept of fourier transform for periodic signals.

Unit - II: Digital communication systems

14. Draw the block diagram of a digital communication system and explain each block in detail.
15. Define amplitude modulation and derive the time domain equation for an AM wave.
16. Give a detail account on the classification of pulse modulation techniques.
17. Explain in brief about the generation and demodulation of PPM signals.
18. Define PCM. Explain coding and decoding of PCM signal with block diagram.
19. Explain delta modulation with block diagram.
20. Describe adaptive delta modulation with block diagram and wave forms.
21. Explain the process of quantization with suitable waveforms.
22. Explain amplitude shift keying modulation and demodulation with diagram.

23. Explain the function of a QAM coherent demodulator and draw its block diagram.
24. Explain in brief about Quadrature amplitude modulator.
25. Write a short notes on the following
 - a) BPSK Signal
 - b) BPSK modulator
 - c) Coherent BPSK demodulator
26. Compare ASK, FSK and PSK.
27. Write a short notes on,
 - a) BFSK signal
 - b) BFSK modulator
 - c) Coherent BFSK demodulator
28. What are advantages and disadvantages of FSK?
29. With the help of a block diagram explain base band binary data transmission system.
30. Draw the block diagram of base band communication receiver and explain the importance of each block.
31. What are the types of digital modulation techniques? Explain briefly
32. Define coded communication and list its types.
33. With neat diagram explain the modulation and demodulation of pulse width modulation.
34. Explain quantization noise.
35. What are advantages and disadvantages of ASK?

Unit - III: Error detection and coding

36. Explain the error detection using parity bit.
37. Explain the cyclic redundancy check method of error detection.
38. Explain how hamming code is useful for correcting and detecting the errors using an example.
39. Generate the hamming code for the data 1110001100
40. Write a short notes on cyclic codes.
41. Draw and explain different ways of representing binary data by electrical signals.
42. Discuss Walsh coded in detail.
43. Define error detection and error correction.
44. List different error detection and correction techniques.
45. Define
 - a) Hamming code
 - b) Hamming weight
 - c) Hamming distance

d) Minimum hamming distance

46. State data encoding and list different analog to digital signal encoding schemes.

Unit - IV: Case studies

47. Write a short notes on paging systems.

48. Draw and explain the block diagram of basic cellular system.

49. Explain the process of call progress in a cellular telephone system.

50. Write short notes on global positioning system.

51. Discuss in detail about the segments of GPS.

52. Explain GPS receiver.

53. Describe principle of operation of fax system.

54. Write a short notes on video text.

55. Write the advantages ,disadvantages and application of paging system

56. What are the advantages and disadvantages of cellular telephone systems.

57. Discuss the merits and demerits of FAX machines.

58. List out advantages and disadvantages and applications of video text.

59. Mention the merits, demerits and applications of GPS.

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