



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:IV
Class:SY	Program:B.Tech
Branch Code:ETC	Pattern:2023
Name of Course:Analog and Digital Communication	Course Code:2302213
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

- 1a) Describe Armstrong method for FM generation. (6) CO1

Question No. 2

- 2a) How we recover the FM signal using PLL? (6) CO2

Question No. 3

- 3a) How do PAM, PWM, and PPM differ in how they modulate signals? (8) CO3

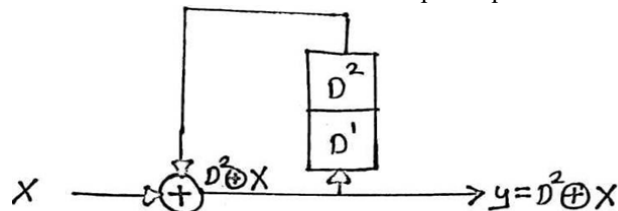
OR

- 3b) Discuss the principle of Delta modulation in detail with diagram. (8) CO3

- 3c) Encode the bit stream 11110110 into Unipolar NRZ, Unipolar RZ, Polar NRZ, AMI, Manchester, Polar RZ codes, Polar Quaternary code (8) CO3

OR

- 3d) The data stream of [10011] is given to scrambler shown below. Determine output sequence of (8) CO3



scrambler. Assume initial contents zero.

Question No. 4

- 4a) With necessary equations and signal space diagram, obtain the probability of error for coherent binary FSK systems (8) CO4

OR

- 4b) Draw the block diagram of QPSK transmitter and QPSK receiver and explain their operation. (8) CO4

- 4c) Explain BPSK signal transmission with suitable waveform. Also, write advantages, Disadvantages and application of BPSK (8) CO4

OR

- 4d) With necessary equations and signal space diagram, obtain the Euclidean distance for coherent binary FSK systems (8) CO4

Question No. 5

- 5a) In a radio receiver the RF amplifier and mixer are connected in a cascade. The RF amplifier has a noise figure of 9 dB and the power gain of 15 dB. The mixer has noise figure of 20dB. Calculate the overall noise figure for the cascade connection. (8) CO5

OR

- 5b) Three telephone circuits each having an SNR of 44dB are connected in tandem. Determine the overall SNR. A fourth circuit is now added that has an SNR 34dB. Determine the new overall value (8) CO5

- 5c) Define the terms: Noise Figure, Noise temperature, Noise Bandwidth, SNR. (8) CO5

OR

- 5d) Show that the random process $x(t) = A \cos(\omega_0 t + \Theta)$ is wide sense stationary, where A and ω_0 are constant, and Θ is a random variably distributed in the range $(0, 2\pi)$. (8) CO5

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