



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

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:III
Class:SY	Program:B.Tech
Branch Code:INT	Pattern:2022
Name of Course:Digital Communication	Course Code:INT222005
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 _03_ page(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.

Question No. 1 Attempt following Question

- 1a) Explain Arithmetic Coding. Let our alphabet consists of only three symbols A, B and C with probabilities of occurrence as $P(A)=0.5$, $P(B)=0.25$, $P(C)=0.25$. Calculate the arithmetic code for BACA. Explain each step. (6) CO1

Question No. 2 Attempt following Question

- 2a) What is Data Communication? Draw and explain various Components of Data Communication (6) CO2

Question No. 3 Attempt following Question

- 3a) Explain Unipolar Line Coding Scheme. List out the Advantages and Disadvantages of Unipolar Line Coding Scheme (Any 2) (5) CO3

OR

- 3b) Explain Line Coding and Decoding with suitable diagram. Write down the difference between a Data element and a Signal element (5) CO3

- 3c) Explain Amplitude Shift keying. List Advantage and disadvantages of Amplitude Shift keying modulator (5) CO3

OR

- 3d) Explain Quantization, Quantization level and Steps in Quantization. (5) CO3

- 3e) Represent the data element-01011001 in to Unipolar, NRZ-L, NRZ-I, RZ, Manchester and Differential Manchester Scheme and explain each representation (6) CO3

OR

Question No. 4 Attempt following Question

- 4a) List out the Types of Errors with suitable example. Explain methods of error correction (5) CO4

OR

- 4b) Explain Simple Parity-Check Code. Assume in simple parity-check code, the sender sends the dataword 1011. The codeword created from this dataword is 10111, which is sent. Explain all the possible transmission scenarios for this and Prove that “A simple parity-check code can detect an odd number of errors” (5) CO4

- 4c) Explain Hamming Distance and Minimum Hamming Distance? Calculate Hamming distance between following two words – (5) CO4

1) 10101, 11110

2) 10001001 and 10110001

OR

- 4d) What is Block Coding? Explain Process of Error Detection and Correction in Block Coding with suitable example (5) CO4

- 4e) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is x^3+1 . (6) CO4

1. What is the actual bit string transmitted?

2. Suppose the third bit from the left is inverted during transmission. At the receiver end what exactly is received?

OR

- 4f) Explain Cyclic Redundancy Check (CRC). Explain CRC Encoder suitable diagram. (6) CO4

Question No. 5 Attempt following Question

- 5a) What is Plain Text ? List out the Advantages and Disadvantage of the same (5) CO5

OR

- 5b) Explain Mono-Alphabetic Cipher (5) CO5

- 5c) List out the Difference Between Symmetric and Asymmetric Key Encryption (5) CO5

OR

- 5d) Explain Algorithm for Caesar Cipher with example (5) CO5

- 5e) Explain RSA algorithm with one example. Show the step by step calculation for Plain text to Cipher text conversion. (6) CO5

OR

- 5f) Explain the Playfair Cipher method. Create the matrix for the following keyword- (6) CO5

1) “Computer”

2) “Monarchy”

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