

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-VII Semester (CSE/IT/CE/BI/BT)

COURSE CODE(CREDITS): 18B1WEC635 (2)

MAX. MARKS: 15

COURSE NAME: Principles of Communication Systems

COURSE INSTRUCTORS: Dr. Alok Kumar

MAX. TIME: 1 Hour

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**Note:** (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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- Q.1** What is modulation? Discuss the role of modulation techniques in the design of communication systems. [CO1] [3 Marks]
- Q.2** What are the key critical parameters to be considered while designing a analog or digital communication system to ensure efficient and reliable transmission of information and how do they impact performance? [CO1, CO2] [3 Marks]
- Q.3** A telephone line has a bandwidth of 20KHz and the signal-to-noise ratio is 16dB. Calculate the theoretical value of maximum channel capacity. [CO1] [2 Marks]
- Q.4** A source emits four symbols: A, B, C, and D with probabilities 0.4, 0.3, 0.2, and 0.1, respectively. If the source emits symbols at a rate of 1000 symbols per second, calculate the source rate in bits per second. [CO1] [3 Marks]
- Q.5** Derived the expression for amplitude modulated (AM) wave by assuming suitable message and carrier signal. Show the AM wave in time domain as well as in frequency domain. If maximum and minimum amplitude of AM wave are 4V and 1 V respectively. Find out the percentage modulation. [CO2] [4 Marks]
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