



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

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech
Branch Code: ADS/COM/CSD	Pattern: 2023
Name of Course: Data Communication and Networking	Course Code: 2301216
Max. Marks: 30	Duration: 1.15 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 02 pages.
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 column indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1 a) Explain the significance of following terms in data transmission: (3) CO1
1. Bandwidth
  2. Data Rate
  3. Latency

- 1 b) Explain components of data communication? (4) CO1

**Question No. 2**

- 2 a) Explain OSI reference model in detail with suitable diagram. (4) CO1
- 2 b) Compare Amplitude Modulation (AM) and Frequency Modulation (FM) techniques. (4) CO1

**Group OR**

- 2 c) Explain in which scenario is full-duplex transmission preferred over half-duplex? (4) CO1
- 2 d) Explain Media Access Control (MAC) and describe its importance in networking. (4) CO1

**Question No. 3**

- 3 a) Explain design issues in Data Link Layer. (3) CO2
- 3 b) Explain how Go-Back-N protocol improves efficiency over the Stop-and-Wait protocol. (4) CO2

**Question No. 4**

- 4 a) Explain the working of Cyclic Redundancy Check (CRC) using the following example (show the complete steps of division) Data Bits: 1101110110 Generator Polynomial :  $x^3 + x + 1$  Write the redundant bits that will be sent along with data bits. (4) CO2

4 b) Explain Sliding Window Protocol.

(4) CO2

**Group OR**

4 c) Solve the following hamming code problem, If 7-bit hamming code word is received by a receiver is 1011011, assume the even parity state whether the receiving codeword is correct or wrong? If wrong locate the bit in error.

(4) CO2

4 d) Explain how ARP works?

(4) CO2

**..... End of question paper.....**