

Total No. of Questions: 6

Seat No.:

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-V Computer Science & Engineering AI & ML : WINTER: 2025**  
**SUBJECT: COMPUTER NETWORKS**

Day : Wednesday  
Date : 10/12/2025

**W-30735-2025**

Time : 02:30 PM-05:30 PM  
Max. Marks : 60

NB :

1. All questions are COMPULSORY.
2. Figures to the right indicate FULL marks.
3. Draw neat labelled diagram WHEREVER necessary.

Q. 1 Define ad-hoc networks. How are they different from infrastructure-based networks? Explain the working, advantages, and challenges of ad-hoc networks with real-life examples such as disaster recovery or military applications. (10)

OR

Q. 1 Write a detailed comparative analysis of the OSI and TCP/IP models in terms of architecture, layers, protocols, and real-world use. Which model is more relevant for current Internet communication, and why? (10)

Q. 2 What are the different types of network topologies (Bus, Star, Ring, Mesh, Hybrid)? Explain each with diagrams, advantages, and disadvantages. Compare them in terms of cost, reliability, and scalability. (10)

OR

Q. 2 What are the different types of transmission media? Explain guided media (twisted pair, coaxial cable, optical Fiber) and unguided media (radio waves, microwaves, infrared) with examples, advantages, and limitations. (10)

Q. 3 What are elementary data link protocols? Explain all the elementary protocols in detail with suitable diagrams. (10)

OR

Q. 3 Given data bits: 101010101 and generator polynomial:  $x^3 + x + 1$ , what is the CRC remainder? (10)

Q. 4 Consider the following network with nodes A, B, C, and D. (10)

- o Cost between A-B = 2
- o Cost between A-C = 5
- o Cost between B-C = 1

- o Cost between B-D = 3
- o Cost between C-D = 2

What will be the routing table at node A in distance vector routing algorithm after the first iteration?

OR

- Q. 4 Subnetting a Class C Network (192.168.1.0/24) (10)  
You have the network 192.168.1.0/24, and you need 6 subnets.  
A: New subnet mask  
B: Hosts per subnet  
C: Range of subnets and broadcast address of 4<sup>th</sup> subnet

- Q. 5 What is Congestion Control? What are the Effects of Congestion Control in transport layer? (10)

OR

- Q. 5 Define User Datagram Protocol (UDP) Header. What is the difference between TCP and UDP? (10)

- Q. 6 Explain Application layer paradigms in detail. (10)

OR

- Q. 6 What is Hyper Text Transfer Protocol (HTTP) and how it works? (10)

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