

Code: 23CS3502, 23AM3502, 23DS3502, 23IT3502

III B.Tech I Semester - Supplementary Examinations - APRIL 2026

COMPUTER NETWORKS **(Common for CSE, AIML, DS, IT)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

PART – A

1.a)	Write any two features of Wide Area Network (WAN).
1.b)	Which OSI layer corresponds to the Transport layer of TCP/IP and list it's functionalities.
1.c)	List any two services provided by the Data Link Layer to the Network Layer.
1.d)	Differentiate between fixed-size framing and variable-size framing (any two points).
1.e)	Differentiate between Pure ALOHA and Slotted ALOHA.
1.f)	Mention one advantage and one disadvantage of polling.
1.g)	State any two general principles of congestion control.
1.h)	Write any two differences between IPv4 and IPv6.
1.i)	Differentiate between process-to-process and host-to-host delivery.
1.j)	What are the two main categories of transport layer protocols?

PART – B

			Max. Marks
UNIT-I			
2	a)	Explain the role and functions of the Physical Layer in computer networks.	4 M
	b)	A company wants high-speed, long-distance communication without electromagnetic interference. Which medium should they choose and why?	6 M
OR			
3	a)	Describe twisted-pair cable, coaxial cable, and fiber optic cable with advantages and disadvantages.	4 M
	b)	A bank requires fault tolerance and high reliability in its network. Which topology and medium would you suggest? Defend your answer.	6 M
UNIT-II			
4	a)	Write notes on error control in the Data Link Layer.	4 M
	b)	A network requires high reliability but low delay. Which flow control mechanism would you suggest? Justify.	6 M
OR			
5	a)	Describe the concept of framing and explain fixed-size framing.	4 M
	b)	Propose CRC that balances error detection accuracy with computational overhead with an example.	6 M

UNIT-III			
6	a)	Describe Carrier Sense Multiple Access (CSMA) and its variants.	4 M
	b)	Evaluate the trade-offs between FDMA, TDMA, and CDMA in terms of cost, complexity, and efficiency.	6 M
OR			
7	a)	Discuss the efficiency of ALOHA-based protocols in different traffic conditions.	4 M
	b)	Why does CSMA/CD fail in wireless networks, and how does CSMA/CA overcome this limitation?	6 M
UNIT-IV			
8	a)	Explain store-and-forward packet switching with a neat diagram.	4 M
	b)	Why is hierarchical routing essential for very large networks like the Internet?	6 M
OR			
9	a)	Explain Classless Inter-Domain Routing (CIDR) and its importance.	4 M
	b)	Propose an improvement to the shortest path algorithm to handle dynamically changing traffic.	6 M
UNIT-V			
10	a)	Compare UDP and TCP in terms of overhead, reliability, and latency. In what real-world cases is UDP the superior choice?	4 M
	b)	The World Wide Web uses HTTP as its backbone. Evaluate the limitations of HTTP/1.1 and explain how HTTP/2 and HTTP/3 improve performance.	6 M

OR			
11	a)	DNS is called the “phonebook of the Internet.” Discuss how DNS vulnerabilities (like cache poisoning) can be exploited.	4 M
	b)	Why is spam control still a major problem in email systems despite advanced filtering mechanisms? Suggest technical improvements.	6 M