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CBCS SCHEME

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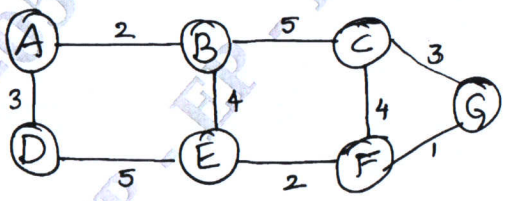
BCS502

Fifth Semester B.E./B.Tech. Degree Examination, June/July 2026
Computer Networks

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define Data Communication. Identify five components of a data communications system. What are the three criteria's necessary for an effective and efficient network.	10	L2	CO1
	b.	Explain Fundamental characteristics of Data Communication, Categorize four basic topologies, cite and advantage of each type.	10	L2	CO1
		OR			
Q.2	a.	With a neat diagram, explain TCP/IP reference model.	10	L2	CO1
	b.	What are the three major classes of guided media? Enlist the advantages of optical fiber over twisted pair and co-axial cable.	10	L2	CO1
		Module – 2			
Q.3	a.	When a bit stream is transmitted using CRC coding with a generator polynomial $x^3 + x + 1$ for the data word $x^3 + 1$. Perform CRC encoding and decoding. Show the decoding case for corrupted and uncorrupted word.	10	L3	CO2
	b.	Explain the working of stop and wait protocol.	10	L2	CO2
		OR			
Q.4	a.	Explain with a neat diagram Transition phases of point-to point protocol.	10	L2	CO1
	b.	Illustrate Three Controlled Access Methods with neat representation. Design a scenario with 4-5 devices in a star/ring topology and demonstrate how token passing ensures orderly data transmission.	10	L3	CO2
		Module – 3			
Q.5	a.	Apply Dijkstra's algorithm to find the shortest path in a network given a topology as in the Fig Q5(a)  Fig Q5(a)	10	L3	CO2
	b.	Analyze the performance of a packet switched network during high traffic load. How does packswitching handle network congestion in comparison to circuit switching?	10	L4	CO3

		OR			
Q.6	**a.**	Write a Pseudcode for Distance Vector Routing (DVR) Algorithm, which enables nodes in network to update their routing tables. Demonstrate how the each node determines the shortest path.	**10**	**L3**	**CO2**
	b.	Analyze the structure of an IPV4 data gram header, particularly focusing on fields like TTL-Time to Live and Checksum. Explain each field purpose.	**10**	**L4**	**CO2**
		Module – 4			
Q.7	**a.**	Explain the TCP segment structure and the significance of its key fields. Analyze how these fields are used to manage and track data segment during transmission.	**10**	**L3**	**CO2**
	b.	Compare and contrast UDP and TCP interms of Reliability and use cases.	**10**	**L3**	**CO2**
		OR			
Q.8	**a.**	Describe the process of TCP connection establishment and termination, including the three-way handshake. Analyze the situation if one of handshake packet is lost or delayed.	**10**	**L4**	**CO2**
	b.	Discuss the flow control and congestion control mechanism used in TCP. Illustrate how TCP adapts to prevent packet loss also handles the data errors.	**10**	**L3**	**CO2**
		Module – 5			
Q.9	**a.**	Discuss the importance of security in Application layer protocols. Explain common security measures implemented in protocol such as HTTPS, SMTPS with diagrams.	**10**	**L2**	**CO3**
	b.	What is Domain Name System (DNS)? Discus message structure and working mechanism with suitable diagram.	**10**	**L2**	**CO2**
		OR			
Q.10	**a.**	Explain the basic model of the File – Transfer Protocol (FTP). Describe its architecture and operations.	**10**	**L2**	**CO1**
	b.	Discuss the architecture of electronic mail systems. Explain the roles of SMTP, POP3, and IMAP protocols.	**10**	**L2**	**CO2**

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