Total number of printed pages: 3 **D/4th/DCSE402**

2024

COMPUTER COMMUNICATION & NETWORKING

Full Marks: 100

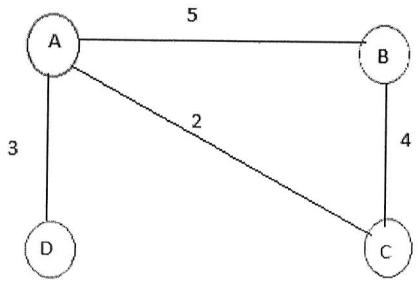
Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Fill in the blanks		5x1=5
		i.	In _____ mode, both stations can transmit and receive data simultaneously.	
		ii.	The topology with the highest reliability is _____.	
		iii.	An IPv4 address is of _____ bits length.	
		iv.	Frames from one LAN can be transmitted to another LAN of similar standard via the device _____.	
		v.	HTTP stands for _____.	
	b)	State True/False		5x1 = 5
		i.	Parity bits are used to detect errors in a transmission.	
		ii.	Flow control is a function of the network layer.	
		iii.	Chances of collision are higher in slotted ALOHA as compared to pure ALOHA.	
		iv.	FDMA is an example of a channelization protocol.	
		v.	UDP is a reliable transport layer protocol.	
	c)	Answer the following in brief.		5x2=10
		i.	State the difference between broadcast and multicast communication.	
		ii.	What is an Internet?	
		iii.	In a TCP segment, what does an acknowledgment number identify?	

		iv.	Define piggybacking.	
		v.	What does a FIN flag used for?	
2.	a)	Why a router device is used?		3
	b)	State the difference between bandwidth and throughput.		3
	c)	A file contains 3 million bytes. How long does it take to download this file using a 56-Kbps channel?		4
	d)	How do guided media differ from unguided media? Give two examples of each and discuss them in brief.		2+8=10
3.	a)	Define flow control and error control.		2+2= 4
	b)	State the limitations of a stop-and-wait protocol. Explain with an example how the sliding window protocol addresses these limitations.		3+6=9
	c)	State the differences between a hub and a switch.		4
	d)	What are the functions of a MAC layer?		3
4.	a)	Explain the working principle of CSMA protocol. Discuss how CSMA/CD can improve CSMA's performance in handling collisions.		5+5=10
	b)	Assume there are 4 stations S1, S2, S3 and S4. Let their data bits are D1=0 D2=0 D3=Silent D4=1 Codes assigned to these stations are C1=[+1 +1 +1 +1] C2=[+1 -1 +1 -1] C1=[+1 +1 -1 -1] C1=[+1 -1 -1 +1] Illustrate how CDMA can send these data bits through a shared channel. If the receiver attempts to recover the transmitted data of station S2, how is it done?		6+4=10
5.	a)	What do you mean by routing? Define static routing and dynamic routing.		2+4=6

	b)	Consider the following system where nodes represent routers and edges represent links between them. Use distance vector routing to create the routing tables for the different routers. Show each step explicitly.  	8
	c)	Apply link state routing on the above network and illustrate how the routing table for router A is created.	6
6.	a)	Compare TCP and UDP.	3
	b)	Discuss how TCP establishes the connection using 3-way handshaking.	5
	c)	Why does congestion occur in a network? Explain how the transport layer handles congestion.	2+4=6
	d)	What do you mean by data compression? Discuss the two categories of compression techniques in brief.	2+4=6
7.	Write short notes on---------(any four)		4x5=20
	a)	Switching	
	b)	Domain Name System	
	c)	Remote Procedural Call	
	d)	Cryptography	
	e)	E-mail	