SVKM'S NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT& ENGINEERING

Academic Year: 2022-2023

Program: B.Tech/MBA Tech Stream: Computer Science, B Tech/MBA
Tech. Computer Engineering and   B Tech/MBA Tech EXTC Engg.

Year: II/III Semester: III/V

Subject: Computer Networks

Time: 03 hrs (11:00 am to 2:00 pm)

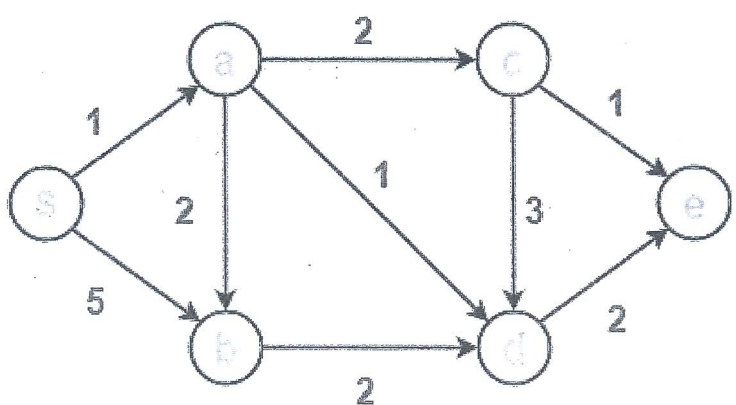Date: 12/06/2023

No. of Pages:03

Marks: 100

Special Re-examination

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory.
2) Out of remaining questions, attempt any 4 questions.
3) **In all 5 questions to be attempted.**
4) All questions carry equal marks.
5) **Answer to each new question to be started on a fresh page.**
6) **Figures in brackets on the right hand side indicate full marks.**
7) **Assume Suitable data if necessary.**

Q1		Answer briefly:	[20]
CO-1, SO-1, BL-2	a.	List the types of computer networks and Compare them on at least 3 parameters.	[5]
CO-3 ,SO-2 BL-3	b.	Given IP Address – 192.168.5.85 /24, find the number of subnets and the number of hosts per subnet. Also, for the first subnet block, find the subnet address, first host ID, last host ID and broadcast address	[5]
CO-2, SO-1, BL-2,5	c.	Justify the importance of transmission media in networking. Differentiate between half-duplex and full-duplex communication?	[5]
CO-3, SO-1, BL-2	d.	Describe the Slotted ALOHA multiple access protocol. How does it overcome the disadvantages of Pure ALOHA? Discuss its working principles and use cases.	[5]
Q2 CO-4,SO-1, BL-4	a.	Compare and contrast the distance vector routing algorithm and the link state routing algorithm by highlighting their key characteristics and advantages.	[10]
CO-2,SO-1, BL-3	b.	Demonstrate frequency division multiplexing and wavelength division multiplexing by using diagram.	[10]
Q3	a.	You are transmitting a 8-bit binary data word, D, over a communication channel	[10]

CO-3; SO-2; BL-5		using Hamming code. The data word to be transmitted is D = 10101100. Determine the Hamming code word that will be sent and calculate the number of bits that need to be changed in order to correct a single error in the received code word.	
CO-4; SO-1;BL-3	b.	Illustrate the use of Domain Name server and what are the different components of DNS server. Why DNS is maintaining hierarchy.	[10]
Q4 CO-3; SO-1; BL-2	a.	Explain the role of the network layer in the TCP/IP model.	[10]
CO-4; SO-1; BL-3	b.	Write name of email protocol used to move messages through the internet from source to destination. Discuss working of email protocol and its components.	[10]
Q5 CO-4; SO-1; BL-2	a.	Compare and analyze the performance of different error control protocols, namely Stop-and-Wait ARQ, Go-back-N ARQ, and Selective Repeat ARQ. Based on your analysis, justify the best-suited protocol for a high-speed data transmission scenario.	[10]
CO-4; SO-1, BL-2	b.	Explain working of process to process communication with diagram and compare TCP with UDP.	[10]
Q6 CO-4; SO-2, BL-3	a.	Apply Dijkstra's Algorithm on the following graph and find the shortest distance from source vertex 'S' to remaining vertices .	[10]
CO-4; SO-1; BL-2	b.	Explain open-loop congestion control and closed-loop congestion control in the Transport Layer.	[10]

Q7	a.	Describe how PDU and SDU can connect from one layer to another layer in data communication.	[05]
CO-1, SO-1, BL-2			
CO-3,SO-1, BL-2	b.	Explain the concept of unicast routing and how it differs from multicast and broadcast routing.	[05]

CO-3,4,SO-1, BL-2	c.	Discuss the roles and functionality of the following:
		   (i) Data link layer
		   (ii) Transport layer
			[05]

CO-3; SO-1; BL-4	d.	Compare and contrast CDMA/CA and CSMA/CD multiple access protocols. Discuss their characteristics, advantages, and applications in networking.	[05]