SVKM'S NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT& ENGINEERING/

SCHOOL OF TECHNOLOGY MANAGEMENT

Academic Year: 2023-2024

Program: B.Tech /MBA Tech /B.Tech Integrated

Year: II Semester: III/V/VII

III/IV

Stream ;Computer/IT/EXTC/AI /CSE CS/ CS/AIML/AIDS

Subject: Computer Networks

Time:3 hrs (10.00 AM to 1.00 PM)
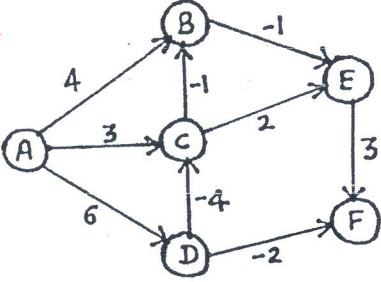
Date: 22/11/2023

No. of Pages:03

Marks: 100

Final Examination /Re Examination (22-23)

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-3 ; BL-01	a.	Describe briefly the classification of computer networks.	[05]
CO-2 ; SO-2 ; BL-03	b.	Compare and contrast pure ALOHA and slotted ALOHA. Briefly explain vulnerable time and how is it calculated in each of them.	[05]
CO-3 ; SO-2 ; BL-02	c.	Explain the significance of IP addressing in computer networks. Illustrate the classful addressing schemes in computer networks, with address range and default subnet mask of each class.	[05]
CO-4 ; SO-6 ; BL-03	d.	UDP would make a good candidate as a transport protocol where reliability is not of primary importance. Justify this statement with any 5 applications of UDP.	[05]
Q2 CO-4 ; SO-6 ; BL-02	a.	Explain the working of Simple Mail Transfer Protocol in sending email messages. Briefly explain the three phases of mail transfer.	[10]
CO-1 ; SO-3 ; BL-02	b.	Draw and explain the OSI network model. Briefly describe the functionalities of each layer.	[10]

Q3 CO-1 ; SO-3 ; BL-02	a.	Distinguish between peer-to-peer communication and client-server communication.		[05]
CO-2 ; SO-2 ; BL-03	b.	Describe the working of CSMA/CD with the help of flow diagram.		[10]
CO-3 ; SO-2 ; BL-02	c.	Explain briefly OSPF routing algorithm.		[05]
Q4 CO-4 ; SO-6 ; BL-03	a.	Describe in detail the working of token bucket and leaky bucket in traffic shaping. Illustrate with diagrams the implementation of each.		[10]
CO-2 ; SO-2 ; BL-03	b.	Illustrate the working of selective repeat ARQ with the help of frame transmission scenarios. Give any one advantage and disadvantage.		[10]
Q5 CO-3 ; SO-2 ; BL-04	a.	An ISP is granted a block of addresses starting with 191.10.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to two groups of customers as follows: a. The first group has 128 customers; each needs 256 addresses. b. The second group has 64 customers; each needs 128 addresses. Design the subblocks and find out how many addresses are still available after these allocations.		[10]
CO-4 ; SO-6 ; BL-02	b.	With the help of a diagram, explain briefly the working of File Transfer Protocol.		[05]
CO-3 ; SO-2 ; BL-02	c.	Explain briefly the significance of ARP protocol in LAN. Illustrate its working with diagram.		[05]
Q6 CO-2 ; SO-2 ; BL-03	a.	Consider data generated at sender 110101 and CRC polynomial $x^3 + x + 1$. Calculate i) CRC code generated at the sender side ii) Final message transmitted from sender to receiver iii) Show message is received without error at receiver.		[10]
CO-3 ; SO-2 ; BL-03	b.	A block of address is granted to a small organization and one of the address is 211.15.35.40/26. Determine the first address and last address in the block. Determine the total number of address in the block.		[05]
CO-4 ; SO-6 ; BL-01	c.	Explain briefly the hierarchy of name servers used in DNS.		[05]

Q7 CO-3 ; SO-2 ; BL-03	a.	Consider the directed graph with costs given below.Determine the shortest path from source vertex A to every other vertex in the graph using Bellman Ford Algorithm. Illustrate step-by-step procedure and draw the shortest path table. 	[10]
CO-4 ; SO-6 ; BL-02	b.	Compare and contrast the open-loop and closed-loop congestion control. Explain the mechanisms used in open-loop and closed-loop.	[10]