SVKM'S NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT& ENGINEERING/

SCHOOL OF TECHNOLOGY MANAGEMENT

Academic Year: 2023-2024

Program/s: MCA

Year: I Semester: I

Stream/s :Computer

Subject: Computer Networks

Time: 3 hrs (10:00am to 1:00pm)

Date: 06 / 02 / 2024

No. of Pages: 2

Marks: 100

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-3 ; BL-2	a.	Explain the fields – fragment offset, flag and identification with respect to IPv4 packet format.	[5]
CO-1 ; BL-4	b.	Compare and contrast the ring and bus network topologies in terms of their advantages and disadvantages.	[5]
CO-2 ; BL-3	c.	Generate even parity hamming code for data bit '1011001'.	[5]
CO-4 ; BL-2	d.	Explain the different flag bits used in TCP datagram format.	[5]
Q2 CO-1; BL-2	a	Explore the tiers of the TCP/IP model and the principal functions linked with each individual layer.	[10]
Q2 CO-2; BL-4	b	Compare the collision resolution methods in CSMA/CD and CSMA/CA	[10]
Q3 CO-2; BL-4	a	Contrast guided and unguided transmission media.	[10]

Q3 CO-4; BL-2	b	Compare and contrast open-loop and closed-loop congestion control strategies. Illustrate scenarios where each approach is most suitable, considering factors such as scalability and adaptability to varying network conditions.	[10]
Q4 CO-4; BL-2	a	Discuss the role of traffic shaping in QoS and elaborate on comprehensive strategies for the successful implementation of this technique, considering its impact on network performance.	[10]
Q4 CO-3; BL-4	b	Differentiate virtual circuit switching and datagram switching. Offer instances where each method is optimally applied, taking into account efficiency and scalability considerations.	[10]
Q5 CO-2; BL-5	a	Create a diagram to illustrate how the Go Back N (ARQ) protocol handles packet transmission and acknowledgment, taking into consideration m=3. Explain all the different cases in your diagram.	[10]
Q5 CO-4; BL-2	b	Discuss IPv6 packet format.	[10]
Q6 CO-3; BL-2	a	Describe how routers use the link state routing algorithm to calculate the shortest path to a destination.	[10]
Q6 CO-2; BL-3	b	Given a bit stream 110010101 is transmitted using the standard CRC method with a generator polynomial $x^4 + x^2 + 1$. i) Calculate the actual bit transmitted. ii) Explain how the receiver can detect an error if the second bit from the left is inverted during transmission when using CRC.	[10]
Q7 CO-4; BL-3	a	Demonstrate the TCP three-way handshake procedure through a step-by-step diagram.	[10]
Q7 CO-4; BL-2	b	Explain any two protocols in detail (With suitable Diagram): 1) HTTP 2) SNMP 3) DNS 4) SMTP	[10]