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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech (Integrated)

SEM: VI - THEORY EXAMINATION (2024-2025)

Subject : Computer Networks

Time: 3 Hours

Max. Marks:100

General Instructions:

IMP: Verify that you have received question paper with correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION – A

20

1. Attempt all parts:-

- 1-a. Multiplexing in computer networks is stated as(CO1) 1
- (a) A process of connecting multiple devices to a network
 - (b) A process of transmitting data from one point to another
 - (c) A process of combining multiple data streams into a single stream for transmission
 - (d) None of the above
- 1-b. Which mode of communication is used in telephone conversations? 1
- (CO1)
- (a) Simplex
 - (b) Half-Duplex
 - (c) Full-Duplex
 - (d) Multiplex

- 1-c. Which layer of the OSI model is associated with error detection and correction? (CO2) 1
- (a) Network Layer
 - (b) Transport Layer
 - (c) Data Link Layer
 - (d) Application Layer
- 1-d. Which of the following is a characteristic of a bridge in the Data Link Layer? (CO2) 1
- (a) Operates at the Network Layer
 - (b) Connects two or more LANs
 - (c) Routes traffic based on IP addresses
 - (d) Can connect networks with different protocols
- 1-e. What is the purpose of RARP (Reverse Address Resolution Protocol)? (CO3) 1
- (a) To translate MAC addresses to IP addresses
 - (b) To resolve domain names to IP addresses
 - (c) To route packets
 - (d) To manage IP address allocation
- 1-f. What is the default subnet mask for a Class C IP address? (CO3) 1
- (a) 255.0.0.0
 - (b) 255.255.0.0
 - (c) 255.255.255.0
 - (d) 255.255.255.255
- 1-g. Transport layer protocols deals with ____ (CO4) 1
- (a) application to application communication
 - (b) process to process communication
 - (c) node to node communication
 - (d) Routing
- 1-h. What is the Size of the UDP Packet Header in the Transport Layer? (CO4) 1
- (a) 8 bytes

	(b) 16 bytes	
	(c) 20 bytes	
	(d) 12 bytes	
1-i.	From the following find the one which is not a network app? (CO5)	1
	(a) E-mail	
	(b) Social Networking	
	(c) Protocols	
	(d) Text Messaging	
1-j.	Which protocol is used to transfer mail from senders user agent to senders mail server? (CO5)	1
	(a) HTTP	
	(b) POP3	
	(c) SMTP	
	(d) FTP	
2.	Attempt all parts:-	
2.a.	Compare point-to-point and multipoint connection?(CO1)	2
2.b.	State and explain the functions of MAC (CO2)	2
2.c.	Identify the purpose of subnetting.(CO3)	2
2.d.	List the events involved in three-way handshaking (CO4)	2
2.e.	Define WWW (CO5)	2
	SECTION – B	30
3.	Answer any <u>five</u> of the following-	
3-a.	What is a switch in a computer network, and how does it differ from a hub?(CO1)	6
3-b.	What are the various transmission media used in network? Explain its types with proper diagram.(CO1)	6
3-c.	Explain slotted Aloha. Prove that the channel utilization is 18% in ALOHA and 37% in slotted ALOHA(CO2)	6
3-d.	Explain Static and dynamic channel allocation. Which one is better and why? (CO2)	6
3-e.	A host with IP 192.168.10.25/28 sends a packet. Identify: (i) The subnet address (ii) The broadcast address (iii) The first and last usable host addresses(CO3)	6

3-f. Differentiate between Connection oriented and Connectionless services.(CO4)	6
3-g. What is the need of DNS and firewalls? (CO5)	6
SECTION – C	50
4. Answer any <u>one</u> of the following-	
4-a. Explain the advantages and disadvantages of the TCP/IP model compared to the OSI model.(CO1)	10
4-b. How can we apply the use of computer networks in different industries, such as healthcare, education, and finance? Elaborate with example(CO1)	10
5. Answer any <u>one</u> of the following-	
5-a. Explain Sliding window protocol with its types and the suitable examples(CO2)	10
5-b. Obtain CRC code for the bit stream 10011101 using the generator polynomial x^3+1 . Suppose the fourth bit from the left is inverted during transmission then how receiver will detect this error and correct it?(CO2)	10
6. Answer any <u>one</u> of the following-	
6-a. Differentiate between Leaky bucket and token bucket algorithm (CO3)	10
6-b. Explain the Distance vector Routing algorithm & its working with a suitable example (CO3)	10
7. Answer any <u>one</u> of the following-	
7-a. Explain the concept of Connection Management in detail with help of diagram(CO4)	10
7-b. Define quality of service(QoS). Explain the techniques to improve QoS w.r.t Transport layer (CO4)	10
8. Answer any <u>one</u> of the following-	
8-a. Discuss Cryptography and its types with the help of block diagram (CO5)	10
8-b. Write short notes on – email, Telnet, HTTP (CO5)	10