Printed Page:- 04 **Subject Code:- ACSCY0401**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2023 - 2024)

Subject: Computer Networks and Network Programming

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the 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. Which of the following is NOT a goal of computer networks? (CO1) 1

(a) Resource Sharing
(b) Scalability
(c) Security
(d) Isolation

1-b. Which layer of the OSI model is responsible for error detection and correction? (CO1) 1

(a) Network Layer
(b) Transport Layer
(c) Data Link Layer
(d) Physical Layer

1-c. What is the primary purpose of error detection in data communication? (CO2) 1

(a) To prevent unauthorized access
(b) To ensure data integrity
(c) To encrypt data
(d) To manage IP addresses

1-d. Which protocol is used for obtaining an IP address automatically?(CO2) 1

(a) ARP
(b) RARP

(c) DHCP

(d) ICMP

1-e. Which layer of the OSI model is responsible for process-to-process delivery? (CO3) 1

(a) Application Layer

(b) Transport Layer

(c) Network Layer

(d) Data Link Layer

1-f. Which transport layer protocol provides connection-oriented communication? (CO3) 1

(a) TCP

(b) UDP

(c) FTP

(d) DNS

1-g. Which of the following is not a popular network programming library or framework? (CO4) 1

(a) To prevent unauthorized access

(b) To ensure data integrity

(c) To encrypt data

(d) To manage IP addresses

1-h. Which of the following libraries is commonly used for network communication in Python? (CO4) 1

(a) ARP

(b) RARP

(c) DHCP

(d) ICMP

1-i. What does DNS stand for? (CO5) 1

(a) Digital Network Service

(b) Domain Name System

(c) Data Networking System

(d) Dynamic Network SolutionSolution

1-j. What is the primary function of DNS? (CO5) 1

(a) Securing network connections

(b) Resolving domain names to IP addresses

(c) Managing email communication

(d) Encrypting data transmissionsSolution:

2. Attempt all parts:-

2.a. Define LAN. (CO1) 2

2.b.	What is the purpose of error detection in data communication? (CO2)	2
2.c.	What is the primary function of the acknowledgment (ACK) packet in TCP communication? (CO3)	2
2.d.	What is the primary advantage of using the Socket.IO library for network programming in web applications? (CO4)	2
2.e.	Explain HTTP? (CO5)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Describe two goals of computer networks and provide examples of each. (CO1)	6
3-b.	Explain the difference between LAN, MAN, and WAN networks. (CO1)	6
3-c.	Explain the purpose of framing in data communication and provide an example. (CO2)	6
3-d.	Describe two error detection techniques used in data communication. (CO2)	6
3.e.	Explain the concept of process-to-process delivery in networking. (CO3)	6
3.f.	Explain the concept of asynchronous programming in the context of network programming libraries. How does asynchronous programming improve the performance and scalability of network applications? Provide examples using a specific library or framework. (CO4)	6
3.g.	Describe the evolution of the World Wide Web (WWW) and its impact on global communication, information sharing, and commerce. (CO5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain the layers of the TCP / IP model and discuss the function of each layer in network communication. (CO1)	10
4-b.	Explain the layers of the OSI reference model and discuss the function of each layer in network communication. (CO1)	10

5. Answer any one of the following:-

5-a.	Discuss the Routing Algorithms & its types. (CO2)	10
5-b.	Explain the concept of flow control in networking, including its role in managing the rate of data transmission and preventing congestion. (CO2)	10

6. Answer any one of the following:-

6-a.	Explain the role of UDP and TCP as transport layer protocols, highlighting their differences. (CO3)	10
6-b.	Discuss the steps involved in connection management in networking. (CO3)	10

7. Answer any one of the following:-

7-a.	Discuss the Byte Manipulation Functions in detail. (CO4)	10
7-b.	Explain the Network Programming Libraries. (CO4)	10

8. Answer any one of the following:-

8-a.	Explain the principles of data compression and its significance in reducing file sizes for storage and transmission. Discuss the differences between lossless and lossy compression techniques and their applications. (CO5)	10
8-b.	Discuss the concept of Virtual Private Networks (VPN) and their role in providing secure remote access to corporate networks. (CO5)	10