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Subject Code:- BCSCY0401

Roll. No:

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (20..... - 20.....)

Subject: Computer Network 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. Select the correct option that category of network is typically used within a single building or campus? (CO1, K1) 1
- (a) LAN
 - (b) MAN
 - (c) WAN
 - (d) PAN
- 1-b. Identify the option that network device operates at the data link layer of the osi model?(CO1, K2) 1
- (a) Hub
 - (b) Switch
 - (c) Router
 - (d) Repeater
- 1-c. Protocol used to find and report packet delivery errors. (CO2, K1) 1
- (a) ICMP
 - (b) DHCP
 - (c) ARP
 - (d) RARP
- 1-d. OSI model layer that handles logical addressing.(CO2, K1) 1
- (a) Data Link Layer

- (b) Network Layer
 - (c) Transport Layer
 - (d) Physical Layer
- 1-e. Name the transport layer protocol that gives connection-based communication. (CO3, K1) 1
- (a) TCP
 - (b) UDP
 - (c) FTP
 - (d) DNS
- 1-f. State the main aim of connection management in transport layer protocols. (CO3, K1) 1
- (a) Error detection
 - (b) Flow control
 - (c) Establishing and terminating connections
 - (d) Address resolution
- 1-g. Select the option used often for network communication in Python. (CO4, K1) 1
- (a) Pygame
 - (b) Requests
 - (c) Socket
 - (d) BeautifulSoup
- 1-h. Pick the C function used to change the byte order of a 16-bit number. (CO4, K1) 1
- (a) swap16()
 - (b) htons()
 - (c) ntohs()
 - (d) htonl()
- 1-i. HTTP stands for what? (CO5, K1) 1
- (a) Hyper Text Transfer Program
 - (b) Hypertext Transfer Protocol
 - (c) High Transfer Programming
 - (d) Host Transfer ProtocolSolution
- 1-j. HTML is used for what in the World Wide Web? (CO5, K1) 1
- (a) It defines the structure and content of web pages.
 - (b) It facilitates communication between web servers and clients.
 - (c) It encrypts sensitive data transmitted over HTTP.
 - (d) It manages domain name resolution

2. Attempt all parts:-

- 2.a. Name one category of network based on geographical coverage. (CO1, K1) 2
- 2.b. Write the purpose of error detection in data communication? (CO2, K1) 2

2.c.	Define flow control in data transmission? (CO3, K1)	2
2.d.	Describe one key feature of the Twisted framework in Python for network programming. (CO4, K2)	2
2.e.	Define DNS? (CO5, K1)	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, K2)	6
3-b.	Describe the role of an ISP in the Internet. (CO1, K2)	6
3-c.	Explain the purpose of framing in data communication and provide an example. (CO2, K2)	6
3-d.	Explain the main functions of a switch in a LAN? (CO2, K2)	6
3.e.	Discuss the significance of TCP congestion control mechanisms. (CO3, K2)	6
3.f.	Compare and contrast the features and capabilities of two popular network programming libraries or frameworks, such as Socket.io and Netty. (CO4, K4)	6
3.g.	Describe the evolution of the World Wide Web (WWW) and its impact on global communication, information sharing, and commerce. (CO5, K2)	6

SECTION-C

50

4. Answer any one of the following:-

4-a.	Discuss the TCP/IP protocol suite and its significance in modern networking. (CO1, K2)	10
4-b.	Discuss the different modes of communication in networking, including simplex, half-duplex, and full-duplex modes, and provide examples of each. (CO1, K2)	10

5. Answer any one of the following:-

5-a.	Discuss the process of error detection and correction in data communication, emphasizing its importance in ensuring data integrity. (CO2, K2)	10
5-b.	Describe the fundamental differences between IPv4 and IPv6 addressing schemes, highlighting the advantages of IPv6 over IPv4. (CO2, K2)	10

6. Answer any one of the following:-

6-a.	Analyze the characteristics of reliable communication in TCP and its importance in data transmission. (CO3, K4)	10
6-b.	Evaluate the challenges and opportunities in implementing advanced Quality of Service (QoS) mechanisms to prioritize traffic and ensure optimal network performance. (CO3, K4)	10

7. Answer any one of the following:-

7-a.	Explain the concept of event-driven architecture in network programming and its implementation in libraries like Node.js and Twisted. (CO4, K2)	10
7-b.	Explain the importance of buffer management in data transmission over network sockets. (CO4, K2)	10

8. Answer any one of the following:-

- 8-a. Discuss the challenges associated with email security, such as spam, phishing, and malware. (CO5, K2) 10
- 8-b. Explain the role of firewalls in network security and the different types of firewall architectures, including stateful inspection firewalls and application-level gateways. (CO5, K2) 10

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