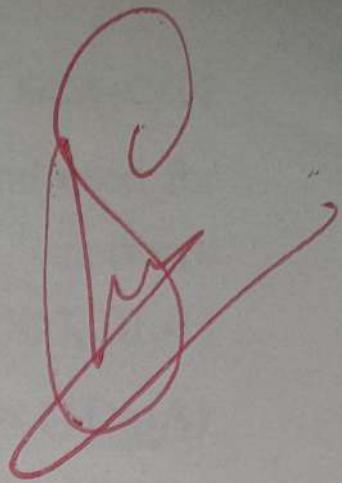


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## **BCA-C402**

### **B. C. A. (Fourth Semester) EXAMINATION, 2024-25**

#### **COMPUTER NETWORKS**

*Time :  $2\frac{1}{2}$  Hours*

*50t.*

*Maximum Marks : 60*

**Note :** Attempt all questions.

#### **Section—A**

##### **(Multiple Choice Questions)**

1. Attempt all questions. 1 each
  - (i) In distributed processing, which of the following is a key advantage ? (CO5, BL-1)
    - (a) Centralized control over all operations
    - (b) Reduced network traffic and better resource sharing

- (c) Only one computer is responsible for all computations
- (d) No need for communication between nodes
- (ii) Which of the following is an example of a transmission impairment ? (CO2, BL-1)
- (a) Attenuation
- (b) Multiplexing
- (c) Modulation
- (d) Synchronization
- (iii) In the OSI model, which layer is responsible for end-to-end communication and reliability ? (CO4, BL-1)
- (a) Network Layer
- (b) Data Link Layer
- (c) Transport Layer
- (d) Physical Layer
- (iv) What is the purpose of the TCP three-way handshake ? (CO3, BL-1)
- (a) To establish a connection
- (b) To terminate a connection
- (c) To check for data corruption
- (d) To provide encryption

(v) Which of the following is a method used for channel allocation in network communication ? (CO3, BL-1)

- (a) Time Division Multiple Access (TDMA)
- (b) Frequency Division Multiple Access (FDMA)
- (c) Code Division Multiple Access (CDMA)
- (d) All of the above

(vi) What is the main function of the Medium Access Control (MAC) sublayer ?

(CO3, BL-1)

- (a) Error detection and correction
- (b) Channel allocation and access control
- (c) Routing of data packets
- (d) Encrypting the transmitted data

(vii) In Pure ALOHA, when can a station send data ? (CO4, BL-1)

- (a) Only at fixed time intervals
- (b) Anytime, without checking if the channel is free
- (c) Only when the channel is idle
- (d) After sensing the carrier signal

(viii) What does CSMA/CD stand for ?(CO4, BL-1)

- (a) Carrier Sense Multiple Access with Collision Detection
- (b) Circuit Switched Media Access with Collision Detection
- (c) Carrier Sense Multiplexed Allocation with Collision Division
- (d) Computer System Multiple Access with Continuous Delivery

(ix) Which IEEE standard is used for Wi-Fi (wireless LAN) ? (CO1, BL-1)

- (a) IEEE 802.3
- (b) IEEE 802.5
- (c) IEEE 802.11
- (d) IEEE 802.15

(x) What is the primary function of the Network Layer ? (CO4, BL-1)

- (a) Error detection and correction
- (b) Routing and forwarding data packets
- (c) Controlling access to the transmission medium
- (d) Encrypting transmitted data

(xi) Which of the following statements about the User Datagram Protocol (UDP) is true ?

(CO1, BL-1)

- (a) It guarantees delivery of packets
- (b) It provides flow control
- (c) It is faster than TCP but less reliable
- (d) It uses a three-way handshake for connection establishment

(xii) Which protocol is used for sending emails from a client to a mail server ? (CO1, BL-1)

- (a) IMAP
- (b) POP3
- (c) FTP
- (d) SMTP

2. Attempt any *four* of the following : 3 each

(a) Differentiate between LAN, MAN, and WAN with examples. (CO2, BL-2)

(b) What is the role of Carrier Sense Multiple Access (CSMA) in network communication ?

(CO2, BL-1)

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- (e) Define routing and explain the difference between static and dynamic routing.

(CO2, BL-1)

- (d) What are the key design issues in the transport layer ?

(CO4, BL-1)

- (e) Explain the concepts of SMTP, and IMAP protocols.

(CO4, BL-2)

### Section—B

3. Attempt any *two* of the following : 6 each

- (a) Explain the OSI reference model with its different layers and their functions.

(CO4, BL-2)

- (b) Explain the working of Pure Aloha and Slotted Aloha. How does Slotted Aloha improve efficiency ?

(CO4, BL-2)

- (c) Describe the working of the Domain Name System (DNS) and its role in network communication.

(CO1, BL-2)

4. Attempt any *two* of the following : 6 each

- (a) Given a network scenario, apply the concept of subnetting and calculate the subnet mask and number of usable hosts.

(CO5, BL-3)

(b) Apply the concept of TCP window management and explain its role in congestion control. (CO4, BL-3)

(c) Apply the concept of error handling in the Data Link Layer and describe various error detection and correction techniques.

(CO4, BL-3)

5. Attempt any *two* of the following : 6 each

(a) Analyze how switching methods (circuit switching, packet switching, and message switching) affect network performance.

(CO5, BL-4)

(b) Compare the key differences between IPv4 and IPv6. How does IPv6 solve the limitations of IPv4 ? (CO2, BL-4)

(c) Analyze the security challenges in networking and suggest measures to mitigate cyber threats at different OSI layers. (CO3, CO5, BL-4)

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