Roll No. ...2309000022.

BCA–C402

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

COMPUTER NETWORKS

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

Maximum Marks : 60

50+.

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)

(1)

(a) Centralized control over all operations

(b) Reduced network traffic and better resource sharing

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(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)

(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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