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| **SESSION** | **FEB-MARCH 2025** |
| **PROGRAM** | **BACHELOR OF COMPUTER APPLICATIONS (BCA)** |
| **SEMESTER** | **IV** |
| **COURSE CODE & NAME** | **DCA2201 COMPUTER NETWORKING** |
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**Set-I**

**Q1. Why is layered model used for computer networks? Explain OSI referenced model**

**Ans 1.**

**Layered Architecture in Networking**

A layered model in computer networks is essential to simplify the design, development, and maintenance of complex network systems. The primary reason for adopting a layered model is to break down the communication process into manageable, well-defined parts that can work independently and interdependently. Each layer performs a specific function and provides services to the layer above it while receiving services from the layer below. This modular

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**Q2. Discuss the working of stop and wait protocol in a noisy channel with the help of an example 10**

**Ans 2.**

**Working of Stop-and-Wait Protocol in a Noisy Channel**

**Stop-and-Wait Protocol**

The Stop-and-Wait protocol is a data link layer communication protocol that ensures reliable data transmission between two devices over a network. In this method, the sender sends one data frame at a time and waits for an acknowledgment (ACK) from the receiver before sending the next frame. This approach is simple but efficient for low-speed or low-error-rate networks.

**Handling a Noisy Channel**

A noisy channel is one that experiences frequent data loss or errors during transmission. In such

**Q3. Give a contrast between unicast, multicast and broadcast. Also explain the way they implemented. 10**

**Ans 3.**

**Comparison Between Unicast, Multicast, and Broadcast with Implementation**

**Data Transmission Modes**

In computer networking, the mode of data transmission refers to the way information is sent from a source to one or multiple destinations. Unicast, multicast, and broadcast are the three primary methods of transmission, each serving different purposes based on the network's needs and efficiency requirements.

**Unicast Transmission**

Unicast is the one-to-one communication model, where data is sent from a single sender to a

**Set-II**

**4. Explain various routing methods follow in network layer. Discuss their purpose in different environments. 5+5**

**Ans 4.**

**Routing Methods Used in the Network Layer and Their Purpose in Various Environments**

**Understanding Routing in the Network Layer**

Routing in the network layer refers to the process of selecting the optimal path for data packets to travel from source to destination. This function is crucial for interconnecting networks and ensuring efficient data delivery. The network layer uses routing protocols and algorithms to determine the best path based on factors like hop count, bandwidth, delay, and reliability.

Routing methods are generally categorized into two types: static routing and dynamic routing. These methods are implemented depending on the size, complexity, and environment of the

strengths tailored to different environments, from small LANs to global internet infrastructures.

**Q5. Explain the process of controlling congestion in the transport layer in detail with the help of examples. 10**

**Ans 5.**

**Congestion Control in the Transport Layer with Examples**

**Congestion in Networking**

Congestion in computer networks occurs when network resources such as bandwidth or buffers are overutilized, causing delays, packet losses, and reduced throughput. The transport layer plays a vital role in managing this issue by implementing congestion control mechanisms that help regulate data flow and maintain performance stability.

**Q6. Compare between the lossy and lossless compression. Discuss the tradeoff between these. 10**

**Ans 6.**

**Comparison Between Lossy and Lossless Compression and Their Trade-offs**

**Understanding Data Compression**

Data compression is a technique used to reduce the size of data files to save storage space and transmission time. Compression can be lossy or lossless, depending on whether the original data can be perfectly reconstructed after decompression. The choice between these two depends on