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| **SESSION** | **NOVEMBER 2024** |
| **PROGRAM** | **MCA** |
| **SEMESTER** | **II** |
| **COURSE CODE & NAME** | **DCA6204 ADVANCED COMPUTER NETWORKS** |
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**Set-I**

**1. Explain the data transfer steps of Frame Relay call control. Explain TCP retransmission strategy.**

**Ans 1.**

**Data Transfer Steps in Frame Relay Call Control**

Frame Relay is a high-performance, wide-area networking technology used to transmit data between devices over a shared network. The data transfer in Frame Relay involves several steps, which can be broadly categorized under call control and data transfer mechanisms. The call control process is essential to establish a logical connection called a Permanent Virtual Circuit (PVC) or Switched Virtual Circuit (SVC) before the actual data transmission.

The process begins with **Call Setup**. In this step, the initiating device sends a setup message to the Frame Relay network, indicating its intention to establish a connection. The network responds by

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**2. Compare Circuit and Packet Switching with example. Describe some SONET/SDH devices.**

**Ans 2.**

**Comparison of Circuit and Packet Switching**

Circuit switching and packet switching are two fundamental approaches to data transmission in telecommunications and networking.

**Circuit Switching** involves establishing a dedicated communication path between the sender and receiver for the entire duration of the communication session. A classic example is a traditional telephone network, where a dedicated circuit is established for a call. Circuit switching guarantees a fixed bandwidth and consistent quality of service but is inefficient for data communication since the resources remain reserved even during idle periods.

**3. What are the differences between dynamic routes and static routes, explain with example? Explain the functioning of the Open Shortest Path First (OSPF) protocol.**

**Ans 3.**

Differences Between Dynamic Routes and Static Routes

Dynamic and static routing are two approaches to managing the flow of data packets in a network. Each has distinct characteristics, advantages, and use cases.

**Static Routes** are manually configured by network administrators. They specify the exact path a data packet must follow to reach its destination. Static routing is simple, reliable, and works well for small or stable networks. For example, in a small office network, an administrator might configure a static route to ensure that all traffic for a specific server follows a defined path.

**Set-II**

**4. Discuss the problems of symmetric key cryptography, discuss with suitable example. Explain RSA technique with an example.**

**Ans 4.**

**Problems of Symmetric Key Cryptography**

Symmetric key cryptography uses a single key for both encryption and decryption, making it faster and computationally less intensive than asymmetric cryptography. However, it has notable problems, particularly in the context of key distribution and management.

The primary challenge is **Key Distribution**. Since both the sender and receiver must possess the same key, securely exchanging this key becomes a significant risk. For example, if the key is sent over an unsecured channel, it could be intercepted by an attacker, compromising the entire

**5. Explain following Network Hardware Components:**

**Network interface card**

**Hub**

**Switch**

**Router**

**Gateway**

**Ans 5.**

**Network Interface Card (NIC)**

The Network Interface Card (NIC) is a critical component that enables devices such as computers, servers, or printers to connect to a network. It serves as the hardware interface between the device and the network medium, whether wired or wireless. NICs are equipped with a unique identifier called a Media Access Control (MAC) address, which ensures device-level identification within the network.

A NIC operates by converting data from the device into signals that can be transmitted over the

**6. Explain in detail, the Secure Socket layer. Describe the four types of protocol of SSL.**

**Ans 6.**

**Secure Socket Layer (SSL)**

The Secure Socket Layer (SSL) is a standard security technology used to establish an encrypted link between a web server and a client, such as a browser. SSL ensures that data transmitted over the internet remains private and secure, protecting it from eavesdropping, tampering, and forgery. It operates at the transport layer of the OSI model and uses public key cryptography to establish trust between the communicating parties.

SSL begins with a handshake process, during which the client and server agree on encryption