**Important Questions and Answers for Networking (Internal Exam)**

**Unit 1: Introduction to Computer Network**

1. **Define a computer network and its goals.**
   * A computer network is a group of interconnected devices (such as computers, printers, etc.) that share resources and communicate with each other. Goals include resource sharing, centralized data management, and faster communication.
2. **Explain the different types of network topologies: Mesh, Star, Bus, and Ring.**
   * **Mesh:** Each device is connected to every other device, ensuring high reliability.
   * **Star:** All devices are connected to a central hub. Easy to set up but dependent on the hub.
   * **Bus:** All devices share a single communication line. Cost-effective but prone to failure.
   * **Ring:** Devices are connected in a circular manner. Data travels in one direction.
3. **Describe the modes of communication: Simplex, Half Duplex, and Full Duplex.**
   * **Simplex:** Data flows in one direction only (e.g., keyboard to computer).
   * **Half Duplex:** Data flows in both directions, but only one at a time (e.g., walkie-talkie).
   * **Full Duplex:** Data flows in both directions simultaneously (e.g., telephone).
4. **Differentiate between LAN, MAN, WAN, Internetwork, and Wireless Networks.**
   * **LAN (Local Area Network):** Covers a small geographic area, like a building.
   * **MAN (Metropolitan Area Network):** Spans a city or town.
   * **WAN (Wide Area Network):** Covers a large geographic area, like countries.
   * **Internetwork:** A network of networks (e.g., the Internet).
   * **Wireless Network:** Uses radio waves to connect devices.
5. **Explain the concepts of Server-Based LANs and Peer-to-Peer LANs.**
   * **Server-Based LANs:** Central server manages resources and security.
   * **Peer-to-Peer LANs:** Devices share resources without a central server.
6. **What are protocols and standards? Provide examples.**
   * **Protocols:** Rules for communication (e.g., HTTP, FTP).
   * **Standards:** Established norms ensuring compatibility (e.g., IEEE 802.11 for Wi-Fi).
7. **Describe the functions of Network Software and design issues in layered architecture.**
   * **Network Software:** Manages network resources and communication.
   * **Design Issues:** Include error handling, addressing, and routing.
8. **Compare Connection-Oriented and Connectionless Services.**
   * **Connection-Oriented:** Establishes a connection before data transfer (e.g., TCP).
   * **Connectionless:** Sends data without a prior connection (e.g., UDP).

**Unit 2: Network Models**

1. **Explain the OSI model and the functions of each layer.**
   * The OSI (Open Systems Interconnection) model standardizes networking functions into seven layers:
     1. **Physical:** Transmits raw bits over a medium.
     2. **Data Link:** Ensures error-free data transfer between nodes.
     3. **Network:** Handles routing and addressing (e.g., IP).
     4. **Transport:** Ensures reliable data transfer (e.g., TCP).
     5. **Session:** Manages sessions between applications.
     6. **Presentation:** Formats and encrypts data.
     7. **Application:** Interfaces with the user (e.g., HTTP).
2. **Compare the OSI and TCP/IP models.**
   * **OSI Model:** 7 layers, theoretical model.
   * **TCP/IP Model:** 4 layers, practical model used in real networks.
3. **What is the TCP/IP Protocol Suite? List its components.**
   * A suite of communication protocols used on the Internet, including TCP, IP, HTTP, FTP, and SMTP.
4. **Differentiate between Physical, Logical, Port, and Specific Addresses.**
   * **Physical Address:** Hardware address (e.g., MAC address).
   * **Logical Address:** Network-level address (e.g., IP address).
   * **Port Address:** Identifies specific processes (e.g., port 80 for HTTP).
   * **Specific Address:** User-friendly names (e.g., [www.example.com](http://www.example.com/)).
5. **Describe Classful and Classless Addressing in IP Addressing.**
   * **Classful Addressing:** Divides IP addresses into fixed classes (A, B, C).
   * **Classless Addressing:** Uses subnet masks for flexible allocation.

**Unit 3: Transmission Media**

1. **What are the types of transmission media? Explain guided and unguided media.**
   * **Guided Media:** Uses physical cables (e.g., Twisted Pair, Coaxial, Fiber Optic).
   * **Unguided Media:** Uses wireless signals (e.g., Radio Waves, Microwaves).
2. **Describe the structure, categories, connectors, and applications of Twisted Pair Cable.**
   * **Structure:** Consists of twisted pairs of wires.
   * **Categories:** CAT5, CAT6, etc.
   * **Connectors:** RJ45.
   * **Applications:** Used in LANs and telecommunication.
3. **Explain the advantages and disadvantages of Coaxial and Fiber Optic cables.**
   * **Coaxial Cable:** Cost-effective, but limited bandwidth.
   * **Fiber Optic Cable:** High bandwidth and long-distance communication but expensive.
4. **What are the characteristics of wireless transmission media?**
   * Wireless media use electromagnetic waves, offering mobility and ease of installation but may face interference issues.

This document covers the key questions and answers that are likely to appear in internal exams for the Networking subject. Focus on understanding these concepts for better preparation.