### CCA-102: Data Communications

### ASSIGNMENT

### 1. What are the different types of networks?

- LAN (Local Area Network): Covers a small area like a home, office.
- MAN (Metropolitan Area Network): Covers a city or campus.
- WAN (Wide Area Network): Covers a large geographical area.
- **PAN (Personal Area Network):** For devices like smartphones and laptops within a short range.
- CAN (Campus Area Network): Interconnects networks in a limited geographical area like a university.

# **2.** Explain the Shielded Twisted Pair (STP) and Unshielded Twisted Pair (UTP)

- **STP:** Has a metallic shield that protects against electromagnetic interference. Used in environments with high interference.
- UTP: No shielding; cheaper and easier to install. Commonly used in LANs.

#### 3. What is the difference between baseband and broadband transmission?

- Baseband: Sends one signal at a time using the entire bandwidth (e.g., Ethernet).
- **Broadband:** Transmits multiple signals simultaneously using different frequencies (e.g., cable TV).

#### 4. What is the difference between a hub, modem, router, and a switch?

- Hub: Broadcasts data to all devices. No data filtering.
- Modem: Connects to the internet by modulating/demodulating signals.
- Router: Routes data between networks and manages IP addresses.
- Switch: Sends data only to the intended device using MAC addresses.

### 5. When you move the NIC cards from one PC to another PC, does the MAC address get transferred as well?

• **Yes**, because the MAC address is hard-coded into the NIC hardware, it moves with the NIC.

### 6. When troubleshooting computer network problems, what common hardware-related problems can occur?

- Faulty cables
- Damaged NIC cards
- Power issues in routers or switches
- Loose connections
- Overheating hardware

### 7. In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program?

• **On all devices, especially the servers**, as they are central to the network and a potential single point of failure.

### 8. Define Static IP and Dynamic IP? Discuss the difference between IPv4 and IPv6.

- Static IP: Manually assigned, doesn't change.
- **Dynamic IP:** Assigned by DHCP, may change over time.
- IPv4: 32-bit, written as 192.168.1.1, supports ~4.3 billion addresses.
- **IPv6:** 128-bit, written as 2001:0db8:85a3::8a2e:0370:7334, supports a vastly larger number of addresses.

#### 9. Discuss TCP/IP model in detail.

- Application Layer: User-level protocols (HTTP, FTP).
- Transport Layer: Manages data delivery (TCP/UDP).
- Internet Layer: IP addressing and routing.
- Network Access Layer: Physical transmission (Ethernet, Wi-Fi).

#### **10.** What is a Web Browser (Browser)? Give some example of browsers.

- Web Browser: A software application to access and view websites.
- Examples: Google Chrome, Mozilla Firefox, Microsoft Edge, Safari.

#### 11. What is a search engine? Give example.

- Search Engine: Tool to find web content by entering keywords.
- **Examples:** Google, Bing, Yahoo.

# **12.** What is the Internet & WWW? What are the uses of internet in our daily life?

- Internet: A global network of interconnected computers.
- WWW (World Wide Web): A service that runs on the internet using browsers and HTTP.
- Uses: Communication (email, social media), education, banking, entertainment, shopping, work.

### 13. What is an Internet Service Provider? Give some example of ISP in India.

- **ISP:** Company that provides internet access.
- Examples: Jio, Airtel, BSNL, ACT, Hathway.

### 14. Discuss the difference between MAC address, IP address and Port address.

- MAC Address: Physical address of a device (e.g., 00:1A:2B:3C:4D:5E).
- IP Address: Logical address for identifying a device on a network.
- Port Address: Identifies specific processes/services (e.g., port 80 for HTTP).

#### 15. How do we view my Internet browser's history?

• Open the browser and press **Ctrl** + **H** or go to the menu and click on **History**.