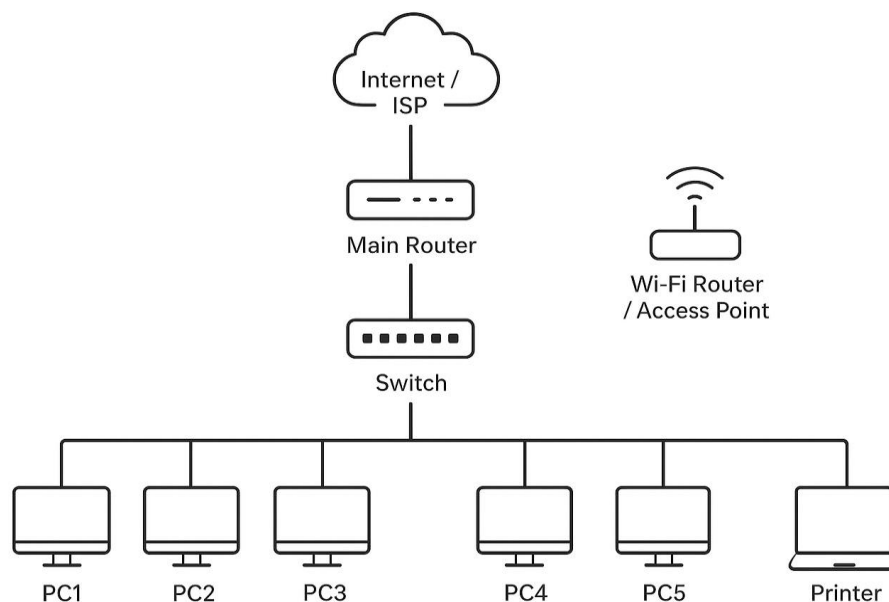**Date: 22/08/ 2025**

Lab Practical #8:

Study & Survey of Institute organization network infrastructure.

Practical Assignment #8:

1. Type of Network in Institute

- The institute uses a **Local Area Network (LAN)** to connect computers, servers, and other devices within buildings.
- **Wired LAN**: Provides high-speed and stable connectivity using Ethernet (Cat5e/Cat6) cables.
- **Wireless LAN (Wi-Fi)**: Provides mobility to students and staff for laptops and mobile devices.
- **Campus Backbone**: Buildings are interconnected using **fiber optic cables**, forming a **Campus Area Network (CAN)**.

2. Network Design (Example: Computer Lab/Floor)

- **Internet/ISP**: Provides external connectivity.
- **Main Router**: Connects ISP to institute network.
- **Switch**: Distributes wired connections to lab computers.
- **Wi-Fi Router/Access Point**: Provides wireless access to mobile devices.
- **Lab PCs & Printer**: End-user devices connected through wired LAN.

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3. Devices & Cables Used

- ▪ **Devices**
    - i. **Router**
        - o Connects institute to the ISP.
        - o Manages routing between external internet and local network.
    - ii. **Switch**
        - o 24/48 port switch connecting all lab PCs.
        - o Provides wired LAN connectivity.
    - iii. **Wi-Fi Router / Access Point**
        - o Provides wireless connectivity to students and staff.
    - iv. **Computers (PCs) (e.g., 40 units)**
        - o Workstations in computer lab connected via switch.
    - v. **Printer / Server**
        - o Shared device accessible within LAN.
- ▪ **Cables**
    - i. **Ethernet Cable (Cat6)**
        - o Used for PC-to-Switch and Switch-to-Router connections.
        - o Supports up to 1 Gbps speed.
    - ii. **Fiber Optic Cable**
        - o Used between buildings for backbone connection.
        - o High bandwidth, supports long-distance data transfer.
    - iii. **Patch Cords**
        - o Short Ethernet cables used from wall ports to end devices.

Conclusion

The institute network is a **hybrid LAN** infrastructure supported by routers, switches, and access points. It uses **Cat6 Ethernet cables** for lab connections and **fiber optics** for building interconnections. This setup ensures high-speed, reliable connectivity for both wired and wireless users across the institute.