🧪 Experiment 2 – Setup a Wired LAN using Layer 2 Switch

🎯 Aim

To set up a wired LAN using a switch, make and test cables using a cable tester, assign IP addresses, test with PING, and analyze packets with Wireshark.

🎓 Objectives

1. Learn the structure and working of different networks.

2. Get hands-on experience in cable making and testing.

⚙️ Tools

- **Hardware:** PC, Switch, RJ-45 connectors, CAT-5/6 cable, Crimping tool, Cable tester

- **Software:** Wireshark, Open-source OS

📑 Important Oral Topics & Answers

1️⃣ What is LAN?

Local Area Network – connects computers within a small area like a lab, school, or building.

2️⃣ Types of Networks:

- **LAN:** Small area (building)

- **MAN:** City-wide network

- **WAN:** Large geographic area (internet)

3️⃣ What is Network Cabling?

It is the physical medium through which data travels between devices.

Types of Cables:

- **UTP (Unshielded Twisted Pair):** Common in LANs. Consists of 4 twisted pairs.

- **STP (Shielded Twisted Pair):** Protected from interference using metallic shield.

- **Coaxial Cable:** Central copper core with metal shield; less interference.

- **Fiber Optic Cable:** Uses light signals; very fast and long-distance communication.

4️⃣ What is RJ-45 Connector?

Standard connector for Ethernet cables, used to connect CAT-5/6 cables to devices.

5️⃣ What is the color code for CAT-6 cable?

- Straight: Both ends same (T568B standard)

- Cross: Ends are opposite wiring.

6️⃣ How to Crimp CAT-5/6 Cable?

- Remove insulation, untwist pairs, arrange wires in color order, insert into RJ-45, and crimp.

7️⃣ What is PING Command?

It checks **connectivity** between two devices by sending **ICMP Echo Request** packets and receiving replies.

8️⃣ What is Wireshark?

Wireshark is a **packet analyzer tool** used to capture and view packets traveling over the network.

✅ Outcome

Created and tested wired LAN with 4 computers using switch and verified communication with PING.