EXPERIMENT NO :3
UNDERSTANDING NETWORK EQUIPMENT: EXPLORING CAT6 UTP 568A/B STRAIGHT AND CROSSOVER TECHNIQUES WITH TESTING METHODS.

OBJECTIVE:
  ➢ To understand the color coding standard of UTP cable
  ➢ To create straight and crossover cable and test/verify its connectivity.

TOOLS:

  ➢ UTP CAT6 cable
  ➢ Crimper
  ➢ LAN tester
  ➢ RJ45 connectors

THEORY:
        CAT6 cables are twisted-pair cables designed for high-speed data transmission, supporting speeds up to 10 Gbps. They contain four pairs of insulated copper wires twisted together to reduce crosstalk, which is interference between signals on different pairs. RJ45 connectors are used to terminate the ends of these cables, providing a standardized way to connect to network devices like routers, switches, or computers. Together, CAT6 cables and RJ45 connectors form the backbone of wired networks, offering fast and reliable internet connections.

Benefits of CAT6 Cables and RJ45 Connectors:
1. Faster Data Speeds: Supports up to 10 Gbps, faster than older cables like Cat5e.
2. Reduced Interference: The twisted-pair design minimizes crosstalk.
3. Durability: Made from high-quality materials for long-lasting use.
4. Versatility: RJ45 connectors are compatible with a wide range of devices.

T568A/B Wiring Standards:
Both T568A and T568B standards use eight-position, eight-conductor (8P8C) RJ45 connectors but differ in the arrangement of the colored wire pairs:
- T568A: Puts Orange/White (pair 1) on pin 1 and Green/White (pair 2) on pin 2, aligning with older USOC telephone wiring.
- T568B: Puts Green/White (pair 2) on pin 1 and Orange/White (pair 1) on pin 2, matching the former AT&T 258A standard.

Choosing the Right Standard:
- T568A is preferred for new installations due to its backward compatibility with older phone systems and potential for better performance over longer distances.
- T568B is also acceptable, especially if it matches existing infrastructure. It's important to use the same standard throughout a network segment to avoid confusion and signal issues.

METHODOLOGY:

There are four pairs of wires in an Ethernet cable, and an Ethernet connector (8P8C) has eight pin slots. Each pin is identified by a number, starting from left to right, with the clip facing away from you. Gather all the required items.
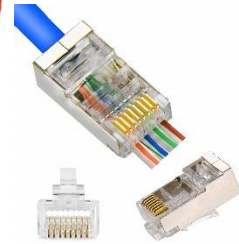

CAT6 cable   **Crimper**   **LAN tester**   **RJ45 connector**

Step 1: Strip the cable jacket about 1.5 inch down from the end.

Step 2: Spread the four pairs of twisted wire apart. Cat 6 cables have a spine that will also need to be cut.

Step 3: Untwist the wire pairs and neatly align them in the T568A or T568B orientation. Be sure   not to untwist them any farther down the cable than where the jacket begins; we want to leave as much of the cable twisted as possible.
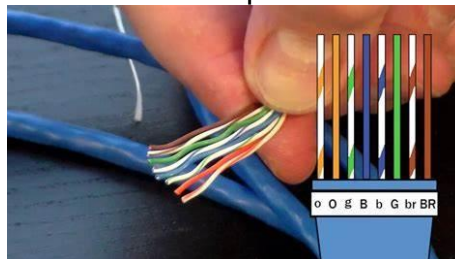
Step 4: Cut the wires as straight as possible, about 0.5 inch above the end of the jacket.

Step 5: Carefully insert the wires all the way into the modular connector, making sure that each wire passes through the appropriate guides inside the connector.

Step 6: Push the connector inside the crimping tool and squeeze the crimper all the way down.

Step 7: Repeat steps 1-6 for the other end of the cable.

Step 8: To make sure you've successfully terminated each end of the cable, use a cable tester to test each pin.

For crossover cables, simply make one end of the cable a T568A and the other end a T568B. Now you can make Ethernet cables of any length, fix broken connectors, or make yourself a crossover cable.

CONCLUSION

Hence, RJ45 connector was connected to the CAT6 twisted pair cable and tested. Also RJ45, CAT6 cable was analyzed and studied.