**Practical-1**

**AIM:** To implement straight through and cross over cable using cat 5 cable and RJ-45 connector.

--------------------------------------------------------------------------------------------------------------------------------------

**Questions**

Students are advised to give answers to following questions after going through in-depth study of all above references:

1. What is the significance of Braided Shield in Shielded Twisted Pair (STP) cable?

* Twisted pairs are made up of two insulated copper wires that are twisted together.
* Shielded Twisted Pair Cable provides better protection from crosstalk and other interference as compared to Unshielded Twisted Pair Cable.
* Shielding reduces the chance of crosstalk and provides protection from interference. It can be easily terminated with a modular connector.

1. List down various network cables in market other than UTP and STP.

* Coaxial Cable.
* Fiber Optic Cable.
* SMF (Single-mode fiber) optical cable
* MMF (multi-mode fiber) optical cable
* Cable Installation Guides.
* Wireless LANs.

1. Where UTP and STP cables are used?

UTP: UTP cables are mostly used for LAN networks.

* They can be used for voice, low-speed data, high-speed data, audio and paging systems, and building automation and control systems.
* UTP cable can be used in both the horizontal and backbone cabling subsystems.

STP: STP cable is used in computer and telephone networking applications including wiring Ethernet connections for computer networks, as well as commercial and residential telephone connections.

4. List down the four parameters, on which the UTP cables are categorised.

The four parameters are:-

• Data rate

• Allowable distance between the nodes

• Gauge

• Impedance and other parameters

1. What is the difference in pin architecture of Cross-over cable and straight through cable?

Answer : The main difference of cross-over cable and straight through cable is

|  |  |
| --- | --- |
| **Straight through** | **Crossover** |
| * Straight-through cable is a type of CAT5 with RJ-45 connectors at each end, and each has the same pin out. | * A Crossover cable is a type of CAT where one end is T568A configuration, and the other end as T568B Configuration. |
| * It is one of the most commonly used cable formats for network cables. | * It is used only for certain applications. |
| * You can also connect it to the router's LAN port to a switch port. | * You can connect it to a router's LAN port to a switch or hub's regular port |

1. Why twisted pair is used in network cable?

Answer: Twisted pair used in network cable because Compared to a single conductor or an untwisted balanced pair, a twisted pair reduces electromagnetic radiation from the pair and crosstalk between neighbouring pairs and improves rejection of external electromagnetic interference.

7. Why do we require two wires for signal transmission in cable and one wire in optic transmission in fibre optic?

• We require two wires for signal transmission in cable because it has a kind of wiring in which the two conductors of a single circuit are twisted together. Here a pair of wires forms a circuit and transmits the data. Mostly these are twisted to provide protection against cross-talk or EMI.

• We require one wire in optic transmission in fibre optic because these transmit data in form of pulses of light that go through a tiny tubes of glasses which will result in internal reflection and transmit data from one end to the other. And they are immune to electromagnetic interference.

8. Write down in 2nd column (which cable to use) below:

|  |  |
| --- | --- |
| **Connection Scenario** | **Cable Type**  **(Cross Over or straight Through)** |
| Computer to Computer | Cross over |
| Cable modem to Router | Cross over |
| Computer to Cable modem | Cross over |
| Computer to Switch | Straight Through |
| Computer to Hub | Straight Through |

9. What is the full form of RJ-45?

Answer: Full form of RJ45 is Registered Jack 45.

10. List down various RJ connectors with their usage.

* RJ-45 :RJ45 connector is the most commonly used Ethernet connector that uses 8-pins, to connect eight separate wires of the Ethernet cable.
* RJ-9/RJ-10/RJ-22-> used for telephone handset cables.
* RJ-12-> used in system phones
* RJ-11 :The arrangement of pins in the connector made it possible for the same telephone lines to be used for transmitting data.
* RJ-48 : RJ48 connector used with twisted-pair cabling for connecting T1 and 56-KB digital data service (DDS) lines.

11. What signal is used for wireline, wireless and fibre communication? Give example how data is transmitted in simplex, half-duplex and full duplex communication with respect to above cables.

• Electromagnetic signals are used in wireless communication.

• Electrical signals are used in wireline communication.

• Optical signals are used in fibre communication.

* Simplex communication-this is a type of communication where channel only sends information in one direction.
* For ex: a radio station usually sends signals to audience but not vice versa.
* In this of fibre communication is carried out.
* Half-duplex communication: here devices can transmit in one direction at a time. Data can move in both directions but not at same time.
  + For Ex: a walkie-talkie, it is a two way radio as it can either transmit or receive data.
  + In this of wireless communication is carried out.
* Full-duplex communication: here devices can transmit in both directions simultaneously. Data can move in both directions at same time.
* For ex: this can be used in telephones, cell phones etc.
* In this of wireline communication is carried out.