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Aim:- Study of different types of Network cables.

a) Understand different types of network cable:-

Different types of cables used in networking are:-

1) Unshielding Twist Pair (UTP) Cable.

2) Shielded Twisted Pair (STP) Cable

3) Coaxial Cable

4) Fibre Optic Cable.

Cable type	Category	Maximum Data Transmission	Advantages / Disadvantages	Application / Use	Image
UTP	Category 3	10 bps	**Advantages** * Cheaper in cost * Easy to install as they have a smaller overall diameter **Disadvantages** * More poone to Electomagnetic intefuence and noise (EMI)	10 Base-T Ethernet	
	Category 5	Up to 100 Mbps		Fast Ethernet, Gigabit Ethernet	Outer jacket. Twisted pairs with coloo-coded plastic Insulation
	Category 5e	1 Gbps		Fast Ethernet, Gigabit Ethernet.	
STP	Category 6, 6a	10 Gbps	**Advantages :-** * Shielded. * Faster than UTP. * Less suseptible to noise and interference.	Gigabit Ethernet, 10G Ethernet (55m) Widely used in data centres.	
SSTP	Category 7	10 Gbps	**Disadvantages :-** * Expensive * Greaton installation effost.	Gigabit Ethernet, 10G Ethernet (100m)	

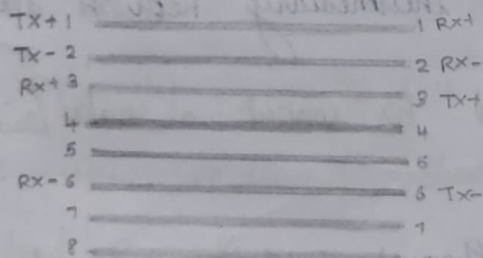| Coaxial cable | RG-6
RG-59
RG-11 | 10-100 Mbps | **Advantages:-**
* High bandwidth
* Immune to interference
* Low loss bandwidth
* Versatile
Disadvantages:-
* Limited distance
* Cost
* Size is bulky. | Speed of signal is 500m
Television network
High speed internet connections |
| Fibre optic cable | Single node
Multi mode | 100 Gbps | **Advantages :-**
* High speed.
* High bandwidth.
* High security
* Long distance
Disadvantages :-
* Expensive
* Require skilled installers | Maximum distance of fibre optic cable is around 100 metres |

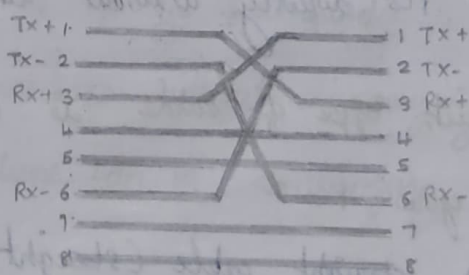b) Make Your Own Ethernet Cross-Over Cable / Straight cable:-

Tools and parts needed:-

* Ethernet cabling. Cat5e is certified for gigabit support, but CAT5 cabling works as well, just over shorter distances

* A crimping tool. This is an all-in-one networking tool shaped to push down the pins in the plug and strip and cut the shielding off the cables.

* Two RJ45 plugs.

* Optional two plug shields.

Straight thru cable   X-over cable

TX+1 ———————— 1 RX+   TX+1 ———————— 1 TX+
TX-2 ———————— 2 RX-   TX-2 ———⟍⟋——— 2 TX-
RX+3 ———————— 3 TX+   RX+3 ——⟍ ⟋——— 3 RX+
4 ———————— 4   4 ——⟋ ⟍——— 4
5 ———————— 5   5 ——⟋ ⟍——— 5
RX-6 ———————— 6 TX-   RX-6 ——⟋ ⟍——— 6 RX-
7 ———————— 7   7 ———————— 7
8 ———————— 8   8 ———————— 8

Result:

Thus, the different types of network cables were Studied and Cross-over and Straight cable of Ethernet were made.

Student Observation :—

1) What is the difference between cross cable and straight cable?

Straight Cable	Cross Cable
A straight cable (or straight-through cable) connects the corresponding pins on both ends of the cable ie pin 1 to pin 1 and so on.	A cross cable has different pin configurations on each end, with the transmit and receive signals crossed. Eg: pin 1 to pin 3.
It is used to connect dissimilar device, such as a computer to a switch, hub or router.	It is used to connect similar devices such as a computer to another computer or a switch to another switch

2) Which type of cable is used to connect two PC?

A cross cable (crossover cable) is used to connect two PCs directly without any intermediary network devices

3) Which type of cable is used to connect a router/switch to your PC?

A straight cable (straight-through cable) is used to connect a router or switch to a PC.

4) Find out the category of twisted pair cable used in your lab to connect the PC to the network socket.

The common category of twisted pair cable used to connect a PC to the network socket is a

LAN is Cat 5e. These cables support Ethernet and Fast Ethernet and are suitable for most home and office networks.

5) Write down your understanding, challenges faced and output received while making a twisted pair cross/straight cable.

Understanding :-

Making a twisted pair cable involves arranging the individual wires according to the desired configuration and crimping them into an RJ-45 connector using a crimping tool.

Challengs Faced :-

Ensuring the correct order of wires. It can be trickly to ensure that the wires are in the correct order according to the T568A or T568B standards.

Properly crimping the connectors without damaging the wires or leaving them loose can be challenging.

Output Recived :-

Upon successfully making a twisted pair cable, it should establish a reliable connection between the devices, enabling communication and data transfer.

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