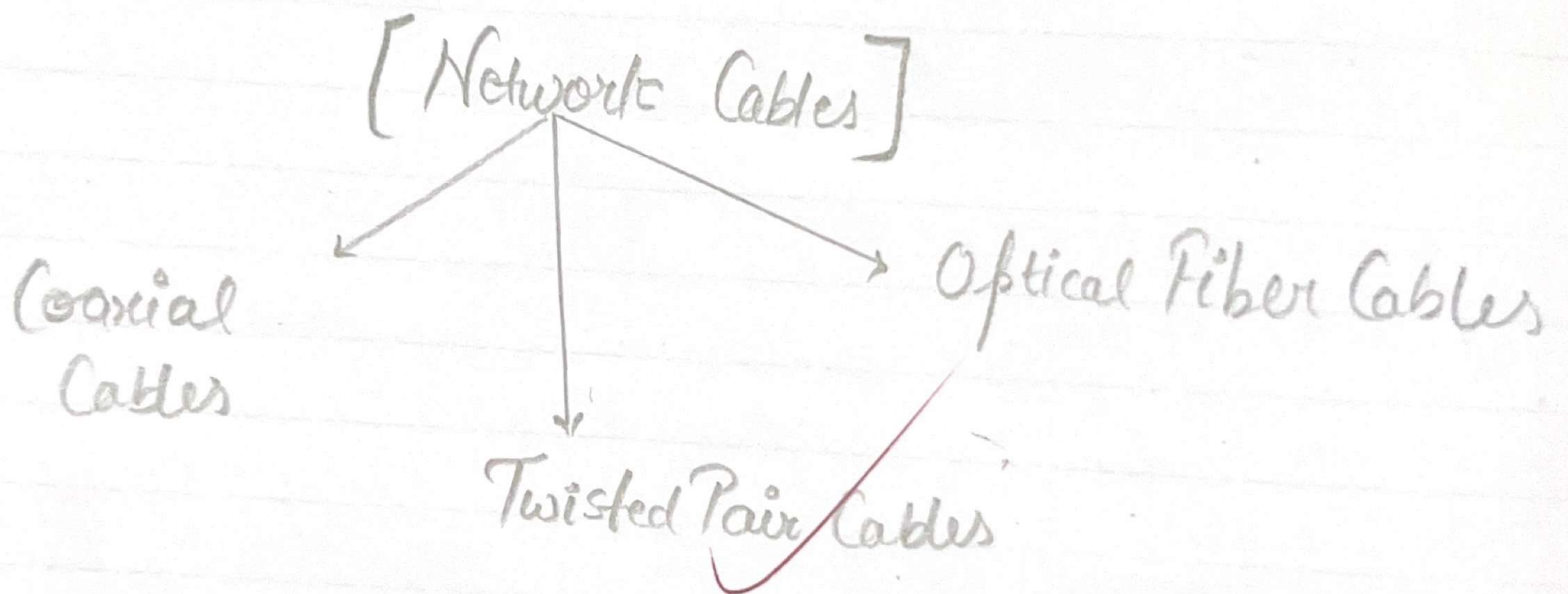
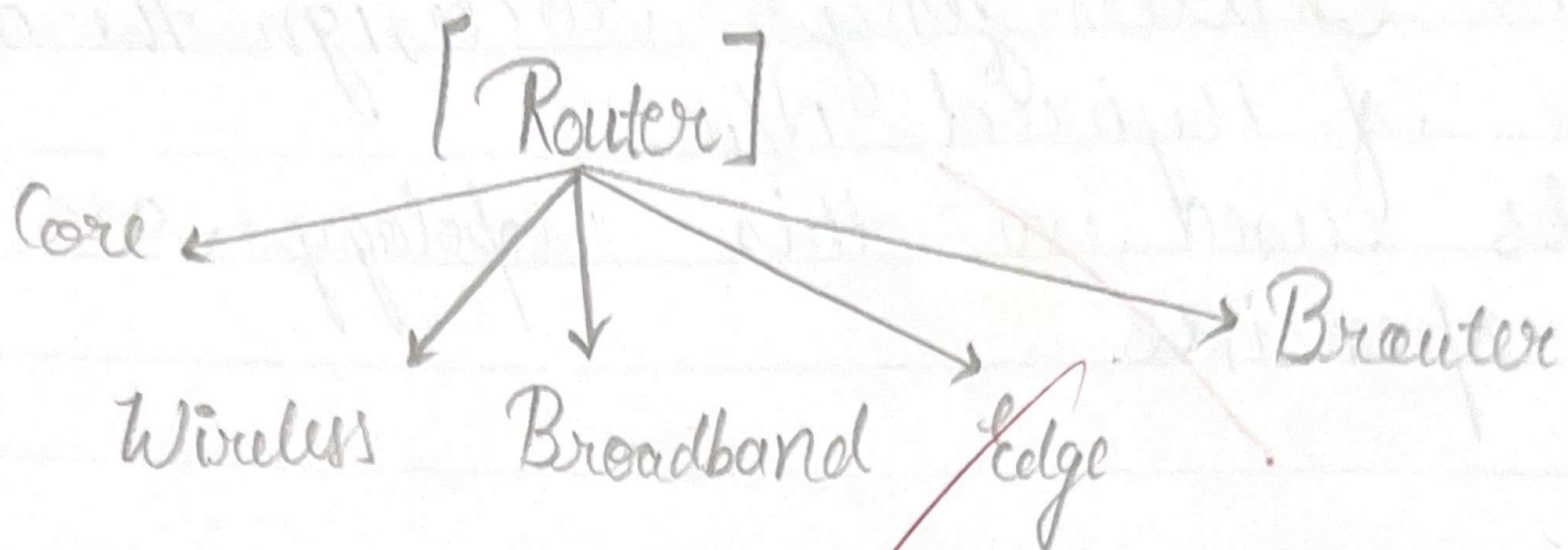




EXPERIMENT - 3

Aim: LAN Installations and Configurations.

Router: It is a device that connects two or more packet-switched networks or subnetworks.

It serves two primary functions: managing traffic between these networks by forwarding data packets to their intended IP addresses, and allowing multiple devices to use the same Internet connection. Routers to operate at layer 3 or a network layer of OSI Model.

Types of Routers - (i) Wireless Router: They provide WiFi connection and standard Ethernet routing.

(ii) Broadband Routers: They are used to connect to the Internet through telephone and to use voice over Internet Protocol (VOIP).

(iii) Core Routers: They can route data packets within a given network, but cannot route the packets between the networks.

(iv) Edge Routers: They are low-capacity routers placed at the periphery of the networks.

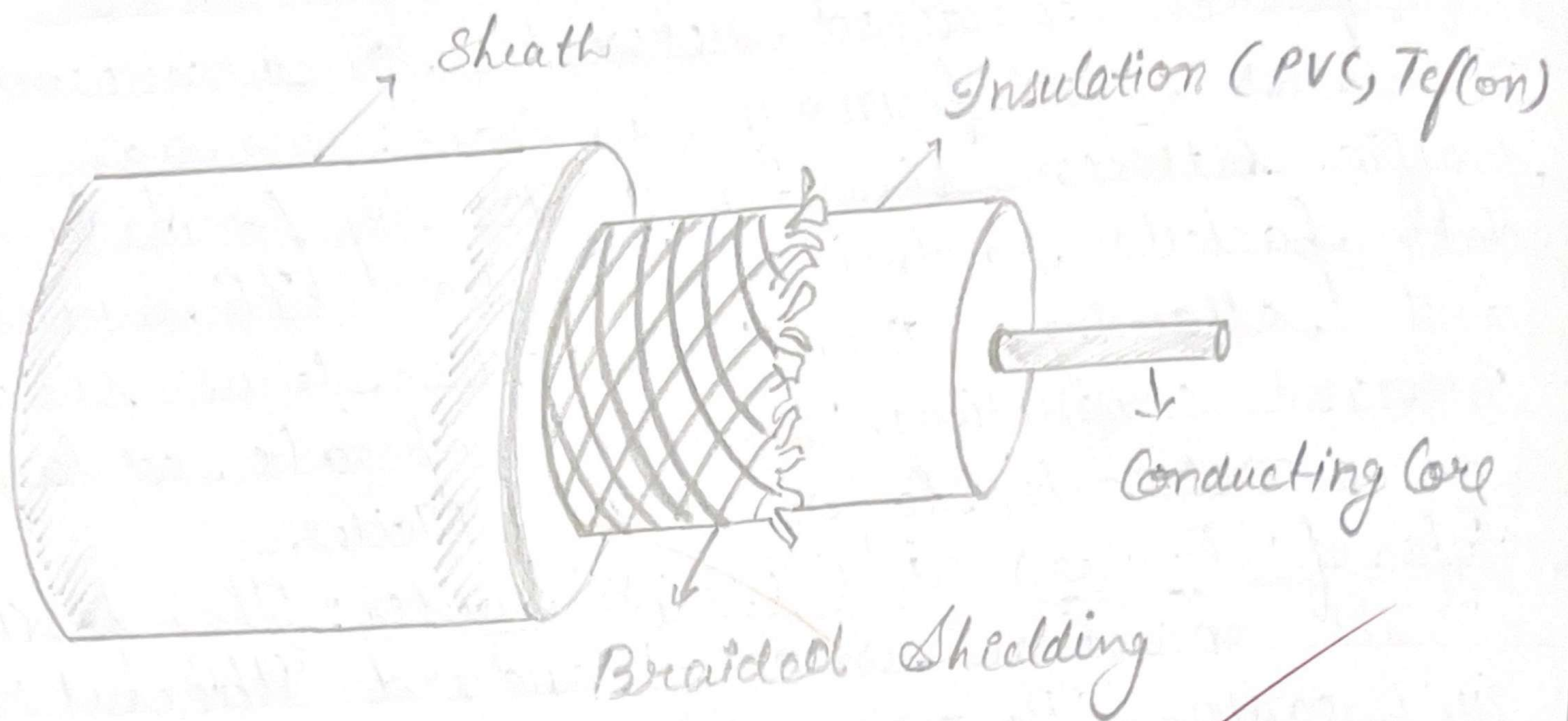
(v) Brouters: They are specialized routers that can provide the functionalities of Bridges as well.

Network Cables: An ethernet cable allows the user to connect their devices, such as computers, mobile phones, routers etc. to a network that will allow a user to

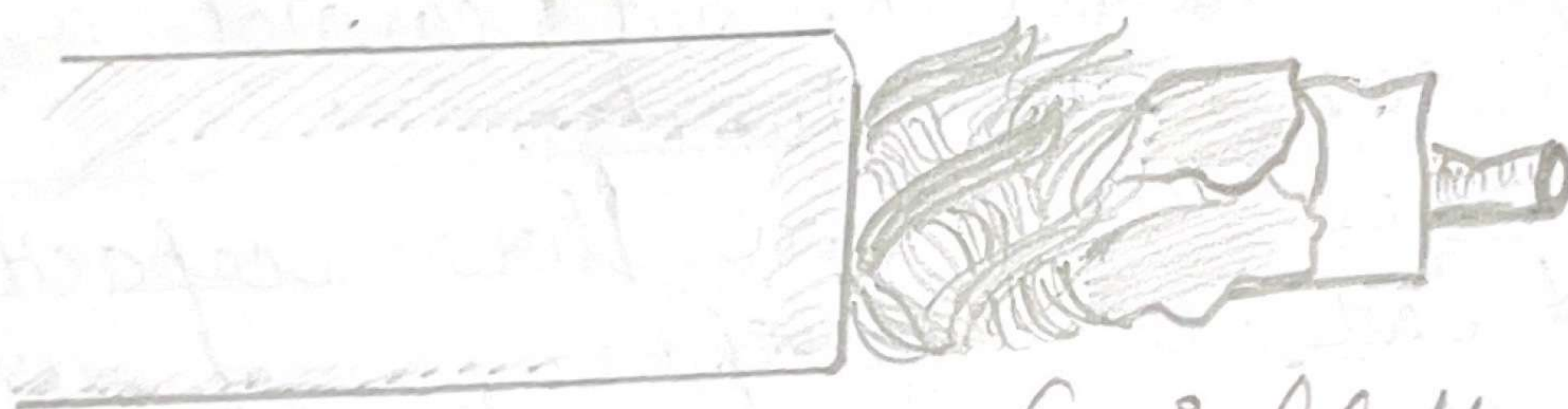
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have internet access, it also carries

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Coaxial Cable



Single Core Coaxial Cable



Multi-Core Coaxial Cable

broadband signals between devices connected through it.

- Types - (i) Coaxial Cables: It is used to carry high frequency electrical signals with low losses. It has copper conductor in the middle that is surrounded by a dielectric insulator usually made of PVC or Teflon.
- Its types - 1. Hardline Coaxial Cable: It is used in high signal strength required applications.

2. RG-6 Coaxial Cable: It is used for better signal requirements.

3. Tri-coaxial Cable: They offer more bandwidth and interference rejection.

• Types of Connectors used in Coaxial Cable:-

(i) BNC (Bayonet Neil Concelman)

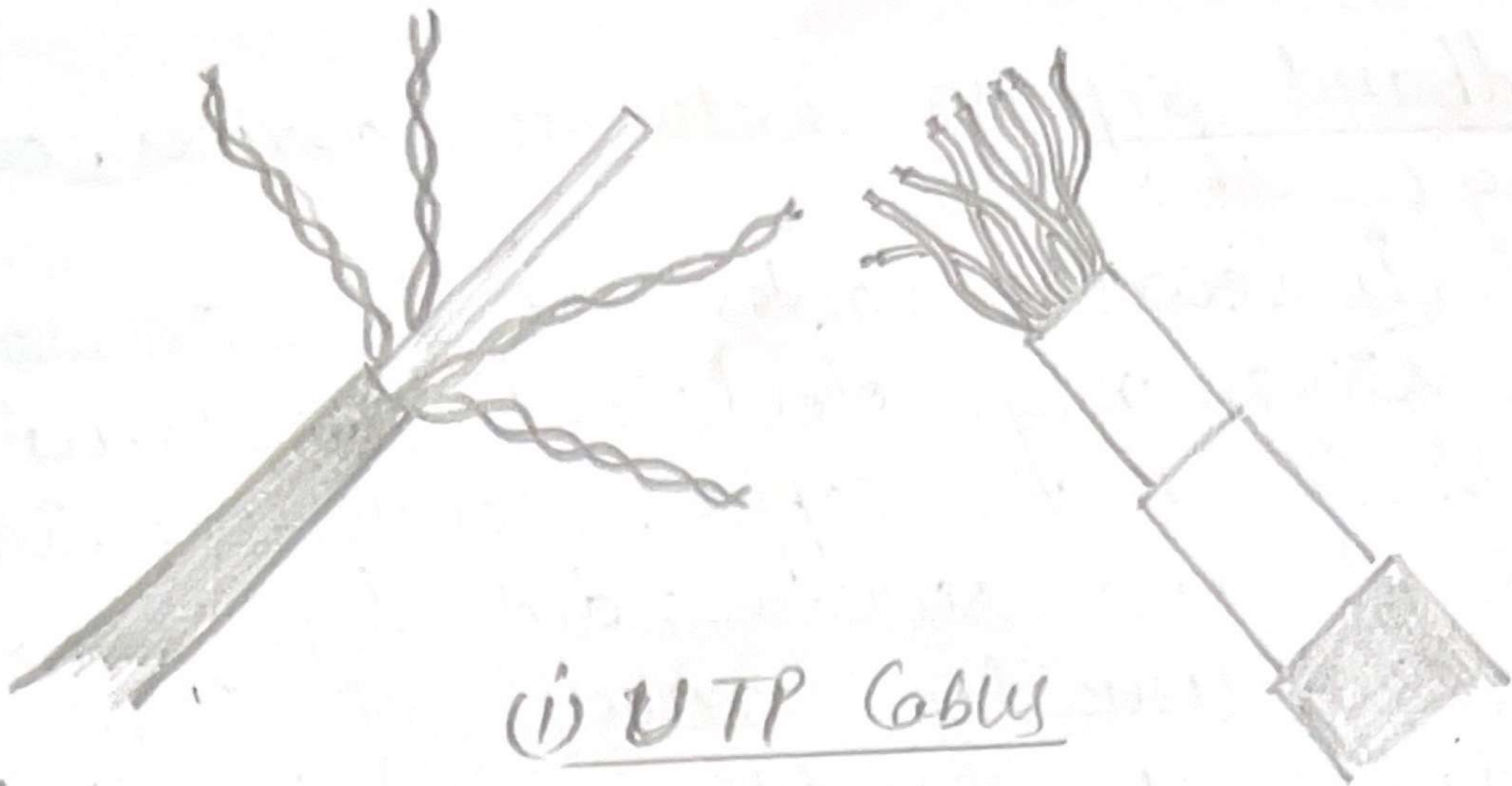
(ii) N-Series Connectors

(iii) F-Type Connectors

(ii) Twisted Pair Cables: It is a copper wire cable in which two insulated copper wires are twisted around each other to reduce interference or crosstalk. It uses RJ-45 Connectors.

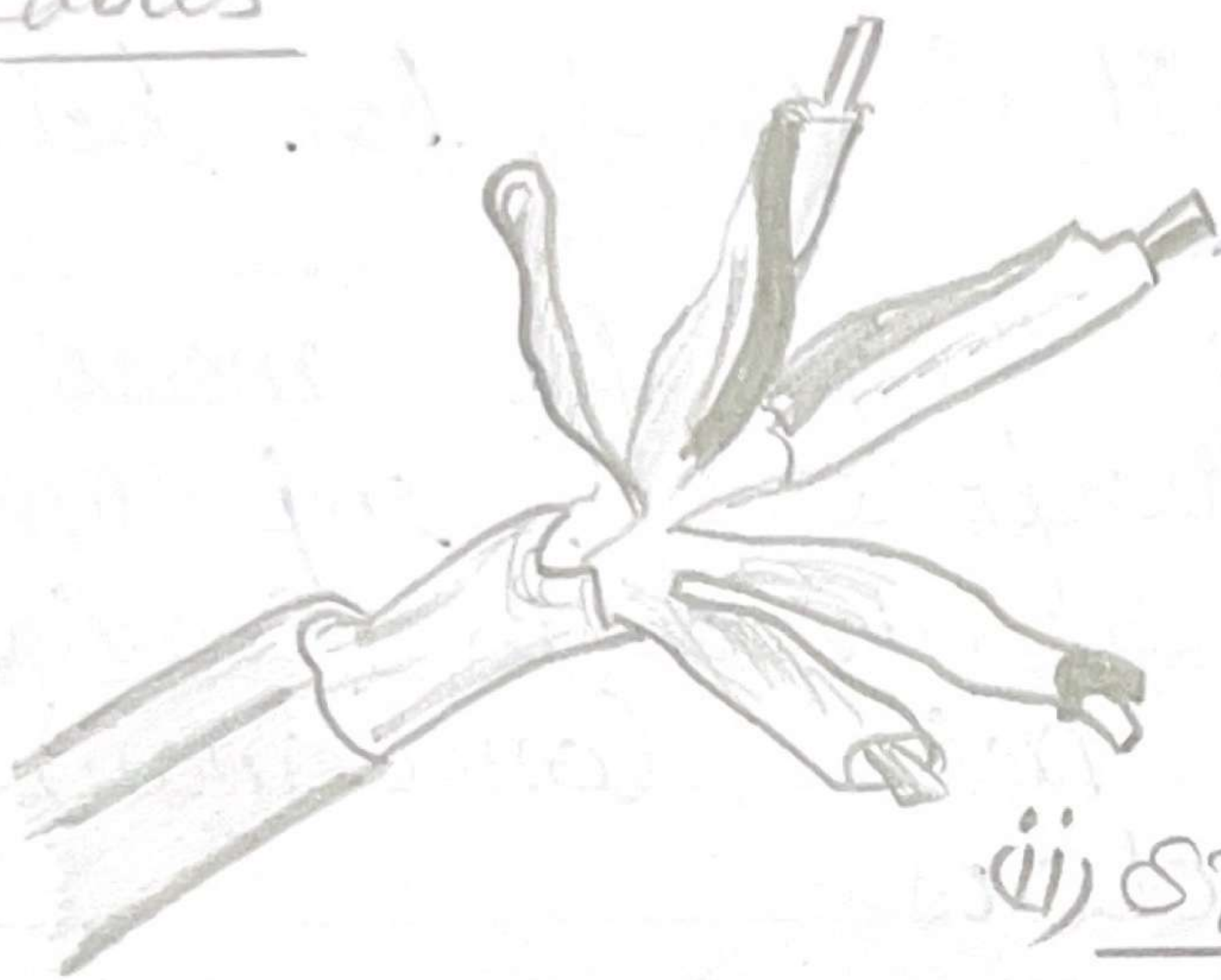
• Its types - 1. Shielded Twisted Pair (STP) Cable: Here, wires are covered by a copper braid covering or foil shield, which protects it against interference leaking into and out of the

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Cable.

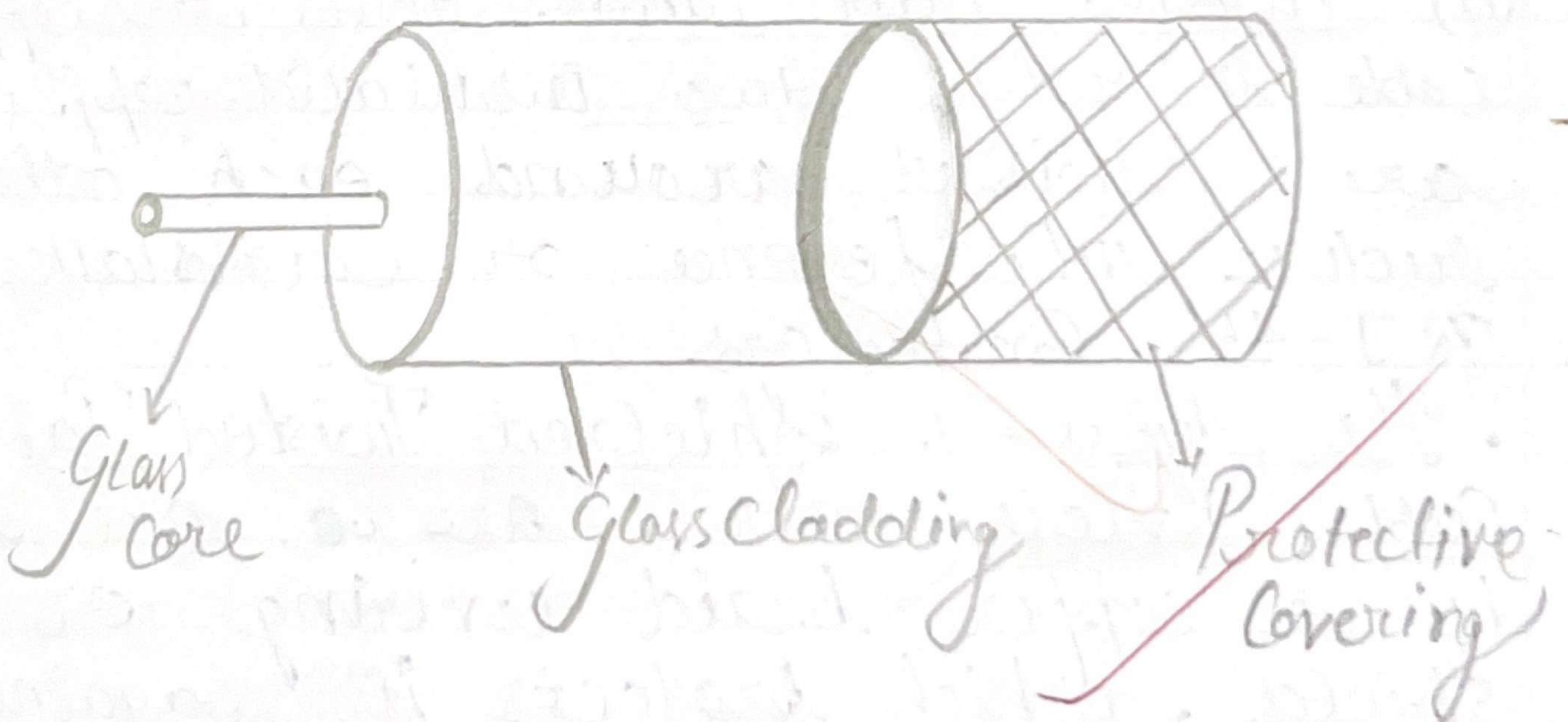
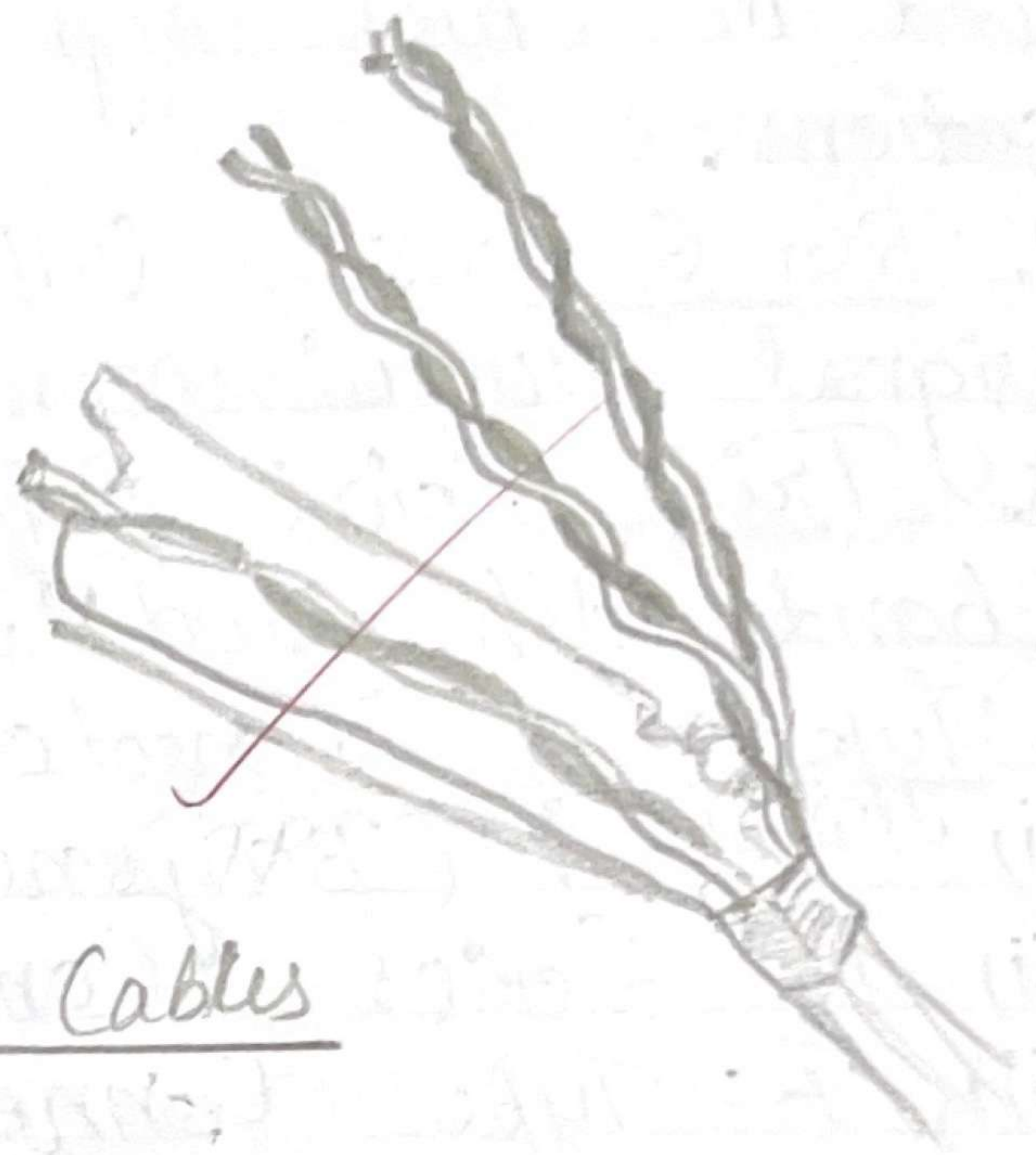


(i) UTP Cables

Twisted
Pair (T.P.)
Cables



(ii) STP Cables



Optical Fiber Cable

2. Unshielded Twisted Pair (UTP) Cable: It is one of the most commonly used cables in computer networks at present time. It consists of two insulated copper wires twisted around each other.

(ii) Fiber Optic Cable: It uses fibres which are made of glass cores surrounded by several layers of cladding material usually made of PVC or Teflon.

• Its types - 1. SMF (Single-Mode Fiber): It uses one single ray of light to transmit data, it is used for long-distance transmission.

2. MMF (Multi-Mode Fiber): It uses multiple light rays to transmit data, it is comparatively less expensive.

• Types of Connectors used :-

- (i) ST (Straight Tip) Connector
- (ii) FC (Fiber Channel) Connector
- (iii) SC (Subscriber) Connector
- (iv) LC (Lucent) Connector

Connectors: It is a device or device that terminates a segment of cabling or provides an entry point for n/w devices, such as computers, hubs and routers. Its types :- Ethernet Cable Connectors, Coaxial Cable Connectors, USB

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Connectors, Fiber optic Cable Connectors etc.

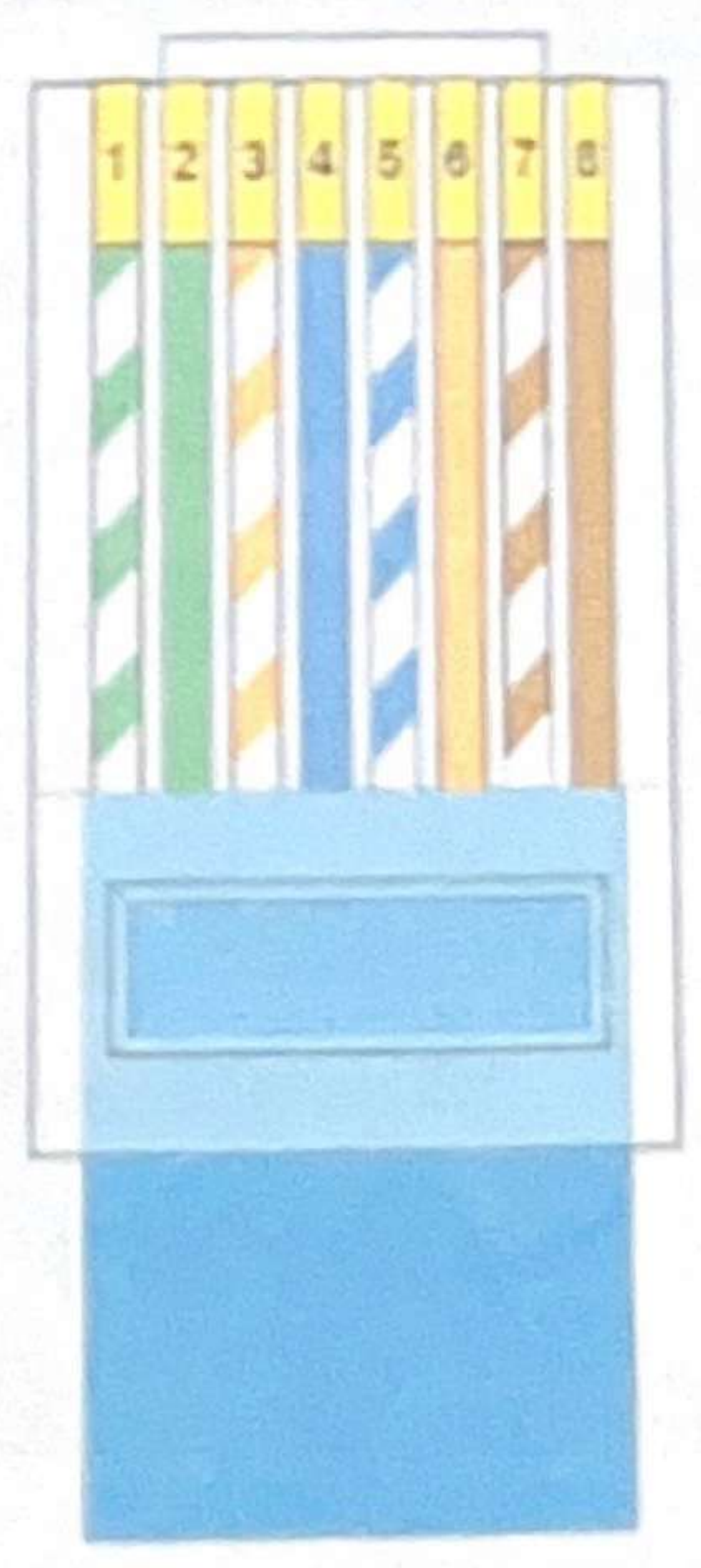
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Straight-Through Ethernet Cable Pin out of T568A

RT45 Pin	Wire Colour
1	White / Green (G/) or (Gr)
2	Green (-g)(Gr)
3	White / Orange (O/) or (O)
4	Blue (b)(B)
5	White / Blue (B/) or (B)
6	Orange (O)
7	White / Brown (Br/)
8	Brown (Br)

EIA/TIA 568A Standard

- 1  Green/White
- 2  Green
- 3  Orange/White
- 4  Blue
- 5  Blue/White
- 6  Orange
- 7  Brown/White
- 8  Brown



RJ-45 Connector: RJ (Registered Jack) is used as a medium in telecommunications or n/w interface. Its types -

- | | | |
|------------|-------------|------------|
| (i) RJ11 | (ii) RJ11-W | (iii) RJ14 |
| (iv) RJ211 | (v) RJ25 | (vi) RJ45 |
| (vii) RJ48 | (viii) RJ61 | |

RJ-45 Connector: It is a widely used type of Registered Jack connector in Ethernet cables or n/w devices. It is similar to the telephone Jack or connector for sharing the data over the local area n/w. These are usually with 8P8C that means eight positions, eight contacts modular connectors.

Straight Through Cable: It is a type of CAT5 Twisted Pair Cable that is used in LANs to connect a computer to a n/w hub, such as 'Router'. It connects the wires within it one to one on both sides.

Crossover Cable: It is a type of cable installation that is used for the interconnection of two similar devices. It is enabled by reversing the transmission and receiving the pins at both ends, so that output from one computer becomes input to the other and vice-versa.

Crimping Tool and LAN Tester: The Crimping Tool is a device that is used to make cold weld

Differences between IPv4 & IPv6 are:-

Sr. No.	IPv4	IPv6
1.	It has 32-bit Address Length.	It is 128-bit Address (has) length.
2.	It supports manual and DHCP address configuration.	It supports auto and renumbering address configuration.
3.	Here, connection integrity is unachievable.	Here, connection integrity is achievable.
4.	It can generate 4.29×10^9 Address space.	It can produce 3.4×10^{38} Address space.
5.	Security feature is dependent on application.	IPSEC is an inbuilt security feature.
6.	Checksum field is available.	Checksum field is not available.
7.	It has a header of 20-60 bytes.	It has header of 40 bytes fixed.
8.	It can be converted to IPv6.	Not all IPv6 can be converted to IPv4.

joints between deforming re
The weld joint parent metal offer some-
RJ-45 (E
LAN Test
and network
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professional

Demarkation
at which a
n/w ends and
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enters the
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ISP (Internet Service Provider)
that provide
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IP (Internet Protocol)
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joints between wires and a connector through deforming one or both of them to hold the other. The weld joint properties are strong as the parent materials when the tool works and offer some result, which is 'crimp'. RJ-11 (6-pin) & RJ-45 (8-pin) are eg. of crimping Tools.

LAN Testers cover the fields of installation and network control. These can be used in the workplace and are ideal for technical service professionals and n/w administrators.

Demarkation Point (D.C.): It is the physical point at which a telecommunications company's public n/w ends and the customer's private n/w begins. It is often the point at which the cable physically enters the building, but this varies from one country to another.

ISP (Internet Service Provider): It is a company that provides individuals and organizations access to the internet and other related services. It is the equipment and telecommunication line access required to have a point of presence on the internet for the geographic area served.

IP (Internet Protocol): It is the set of rules governing the format of data sent via the internet or local n/w.

2.

Manual/DHCP			MAC Address: 0.0.0.0	
IP Address:			Gateway: 0.0.0.0	
Subnet Mask: 255.255.0.0				
DNS Prim Addr: 0.0.0.0			DNS Sec Addr: 0.0.0.0	
WINS Prim Addr: 0.0.0.0			WINS Sec Addr: 0.0.0.0	
DNS Hostname: A-000000-00000				
mDNS Service:				
mDNS Hostname:				
Domain Name:				
Modify	LAN	Set to		Done
Settings	Services	Defaults		↑

Note: This screen reflects the 33500 Series Display. The 33600 Series Corner also includes a LAN Status Indicator in the Upper Right corner.

3.

3.

Manual/DHCP			MAC Address: 0.0.0.0	
IP Address:			Gateway: 0.0.0.0	
Subnet Mask: 255.255.0.0				
DNS Prim Addr: 0.0.0.0			DNS Sec Addr: 0.0.0.0	
WINS Prim Addr: 0.0.0.0			WINS Sec Addr: 0.0.0.0	
DNS Hostname: A-000000-00000				
mDNS Service:				
mDNS Hostname:				
Domain Name:				
Manual	Host	Service		Done
DHCP	Ⓢ Name	Ⓢ mDNS		↑



EXPERIMENT - 4

Aim: LAN Configuration Procedure: There are several parameters that you might need to set to establish n/w communication using the LAN interface. Primarily, you will need to establish an IP address.

1. Select the "I/O" menu.

Press [System] > I/O Config.

2. Select the 'LAN Settings' menu.

Press the LAN Settings softkey.

You can select ~~Modify~~ Settings to change the LAN settings, or you can turn LAN Services on and off or restore the LAN settings to default values.

3. Press 'Modify Settings'.

To access most items on this screen, use the first softkey to switch from DHCP to Manual. With DHCP on, an IP address will automatically be set by DHCP (Dynamic Host Configuration Protocol) when you connect the instrument to the n/w. All you need to do is leave DHCP on. Contact your LAN administrator for details.

4. Establish an "IP Setup".

If you are not using DHCP (if the first softkey is set to Manual), you must establish an IP setup, including an IP address.

The IP Address and Subnet Mask buttons are on the main screen, and you press More to configure the Gateway.

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Contact your n/w administrator for the

Teacher's Signature

4. Manual Configuration

MAC Address : 0.0.0.0

IP Address :

Gateway : 0.0.0.0

Subnet Mask : 255.255.0.0

DNS Prim Addr : 0.0.0.0

DNS Sec Addr : 0.0.0.0

WINS Prim Addr : 0.0.0.0

WINS Sec Addr : 0.0.0.0

Host Name : A.

mDNS Service :

Manual	Host	IP	Subnet	Done	More
DHCP	⌚ Name	⌚ Address	⌚ Mask	↑	⏪ 1 of 3

5.
(ii)

Manual Configuration

MAC Address : 0.0.0.0

IP Address :

Gateway : 0.0.0.0

Subnet Mask : 255.255.0.0

DNS Prim Addr : 0.0.0.0

DNS Sec Addr : 0.0.0.0

WINS Prim Addr : 0.0.0.0

WINS Sec Addr : 0.0.0.0

Host Name : A

mDNS Service :

Gateway	Primary	Second		Done	More
⌚	⌚ DNS	⌚ DNS		↑	⏪ 2 of 3

Enter the Primary DNS and Second DNS. See your n/w administrator for details.

IP address, subnet mask, and gateway to use. All IP addresses take the 'dot notation form' "~~nnn~~ "nnn.nnn.nnn.nnn" where 'nnn' in each case is a byte value in the range 0 through 255.

5. Configure the 'DNS Setup' (optional).

DNS (Domain Name Service) is an Internet service that translates domain names into IP addresses.

(i) Set the 'hostname'.

Press the Host Name, and enter the hostname. A hostname is the host portion of the domain name, which is translated into an IP address. It may include letters, numbers, and dashes ("-"). You can use the keypad for the numeric characters only.

(ii) Set the 'DNS server' addresses. From the LAN configuration screen, press 'More' to go to the second of three sets of softkeys.