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Lab Practical #03:

Study of different types of network cables & connectors and crimping a LAN.

Practical Assignment #03:

1. List various networks cable. Also, write short description.
2. Difference between guided and unguided media.
3. Give cross-wired cable and straight through cable diagram (Color Code wise).

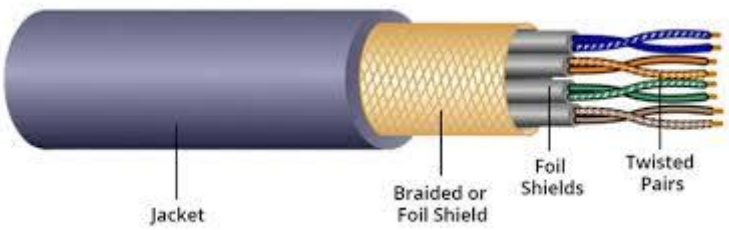
1. List various networks cable and connectors. Also, write short description.

Cabels:

a) Twisted Pair:

- **Description**:
  - It is physical media made up of a pair of cables twisted with each other.
  - It is cheap as compared to other transmission media.
  - Installation of the cable is easy, and it is a lightweight cable.
  - The frequency range for cable is from 0 to 3.5KHz.
  - It consists of two insulated copper wires arrange in a regular spiral pattern.
  - The degree of reduction in noise interference is determined by the number of turns per foot.
  - Increasing the number of turns per foot decreases noise interference.
  - Separately insulated.
  - It is widely used in different kinds of data and voice infrastructure.
  - The use of two wires twisted together helps to reduce crosstalk and electromagnetic induction.
  - Two types of twisted pair cable:
    - Unshielded Twisted Pair Cable : It consists of pairs of copper wires twisted together without any shielding.
    - Shielded Twisted Pair Cabel : Similar to UTP but with an additional shielding layer (metallic foil or braid) around the pairs.

- **Diagram**:



b) Coaxial Cabel:

- **Description**:
  - Outer conductor is braided shield.
  - Inner conductor is solid metal.

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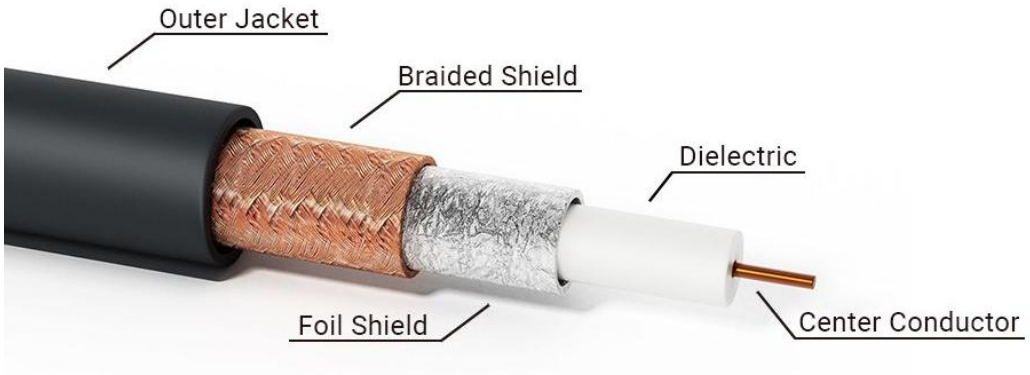
- Separated by insulating material, and whole cover by plastic cover.
- The middle core is responsible for the data transferring whereas the copper mesh prevents from the EMI (Electromagnetic interference).
- Used in television, long distance telephone transmission.
- It has excellent noise immunity.
- It has a higher frequency as compared to Twisted pair cable.
- Two types of coaxial cable:
  - Baseband transmission: It is defined as the process of transmitting a single single at high speed.
  - Broadband transmission: It is defined as the process of transmitting multiple signals simultaneously.

- **Diagram**:



c) Fiber Optic Cable

- **Description**:
  - A fiber-optic cable is made of glass or plastic and transmits signals in form of light.
  - A glass or plastic core is surrounded by a cladding of less dense glass or plastic.
  - The difference in density of the two materials must be such that a beam of light moving through a core is reflected off the cladding instead of being refracted into it.
  - Optical fibers use reflection to guide light through a channel.
  - Core: The optical fiber consists of a narrow stand of glass or plastic known as a core.
  - Cladding: The concentric layer of glass is known as cladding.
  - Jaket: The protective coating consisting of plastic is known as a jacket.
  - Light travels in a straight line as long as it is moving through a single uniform substance.

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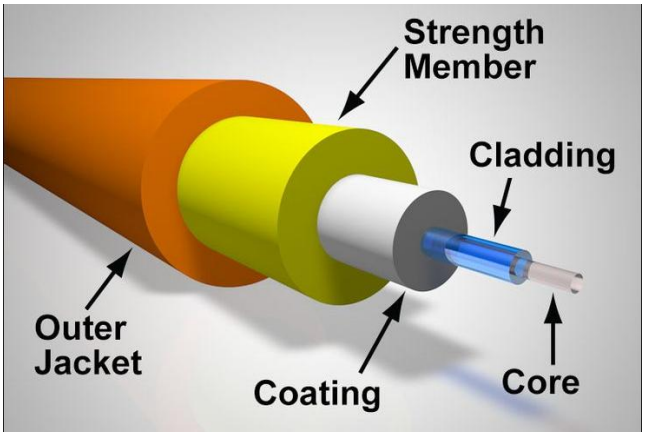
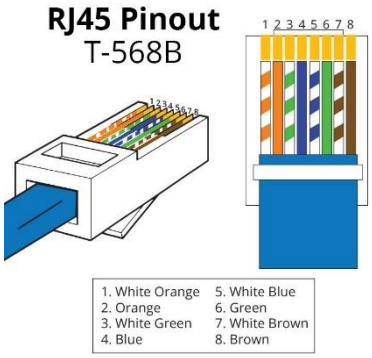
- **Diagram**:



Connectors:

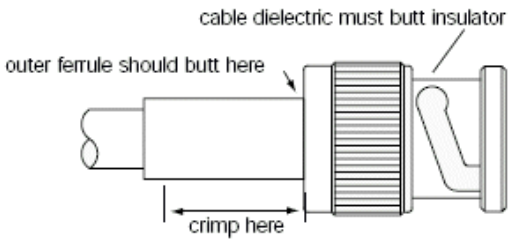
a) RJ-45 Connector

- **Description**:
  - Most common connector for UTP/STP cables in Ethernet networks.
  - Used to connect computers, routers, switches, etc.
  - Has 8 pins for data transmission.
- **Diagram**:



b) BNC Connector

- **Description**:
  - Used with coaxial cables.
  - Commonly used in CCTV, radio, and older Ethernet networks.
  - Provides a secure and quick connection.
- **Diagram**:



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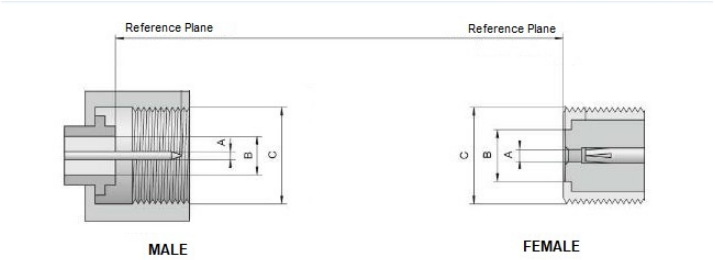
c) F-Type Connector

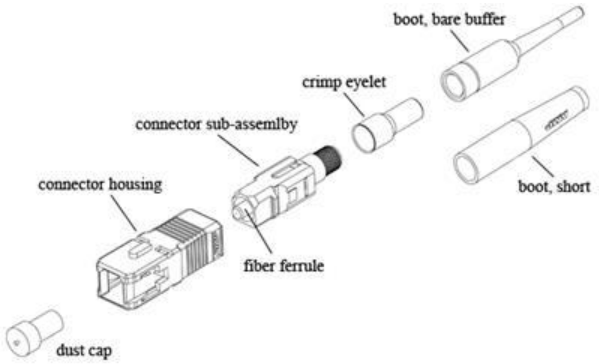
- **Description**:
  - Used with coaxial cables for cable TV and satellite connections.
  - Provides a screw-type connection for stability.
- **Diagram**:



Dimension (mm)	Male	Female
A	0.86 (max.)	1.24 (max.)
B	7.00 nom.	5.00 nom.
C	3/38-32 UNF-2B	3/38-32 UNF-2B

d) LC, SC, ST Connectors (Fiber Optic)

- **Description**:
  - Used to connect fiber optic cables.
  - Provide high-speed, stable connections for internet and backbone networks.
  - LC is compact, SC is square-shaped, and ST has a bayonet-style twist lock.
- **Diagram**:



2. Difference between guided and unguided media.

No.	Guided Media	Unguided Media
1	The guided media is also called wired communication or bounded transmission media.	The unguided media is also called wireless communication or unbounded transmission media
2	The signal energy propagates through wires in guided media.	The signal energy propagates through the air in unguided media.

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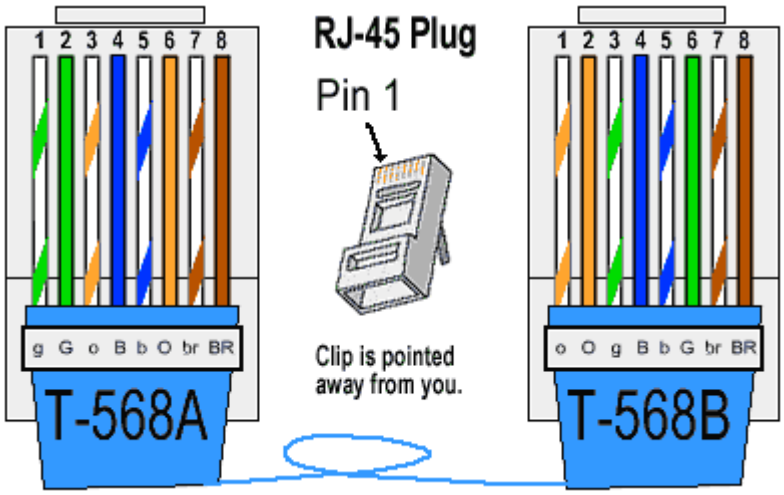
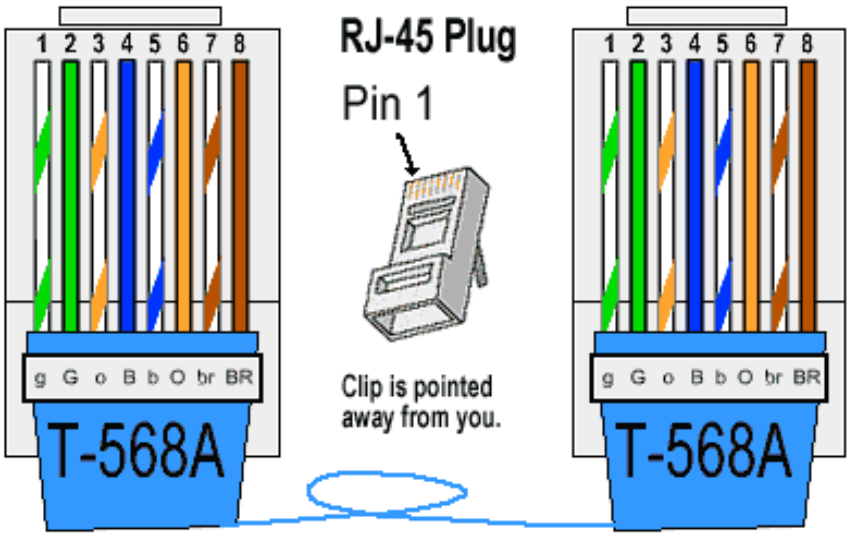
3	Used to perform point-to-point communication.	Unguided media is generally suited for radio broadcasting in all direction.
4	It is affordable.	It is costly.
5	Discrete network topologies are formed by the guided media.	Signals are in the form of electromagnetic waves in unguided media.
6	For a shorter distance, this is the best option.	For longer distance, this method is used.
7	It is unable to pass through walls.	It can pass through walls.

3. Give cross-wired cable and straight through cable diagram (Color Code wise).

a) Cross-wired Cable Diagram (Color Code)



b) Straight Through Cable Diagram (Color Code)



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