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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).

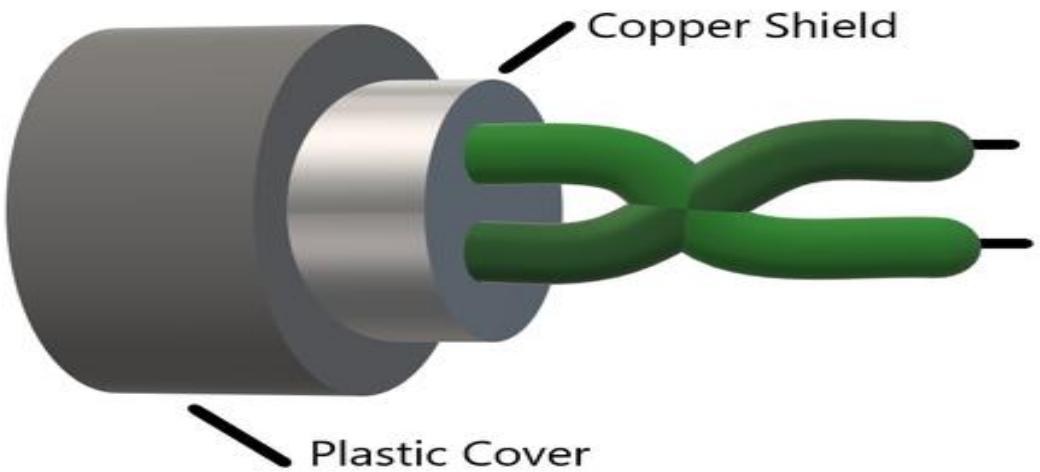
1. List various networks cable and connectors. Also, write short description.

a) Network Cable Name: Twisted Pair Cable

❖ **Description**:

- It is a 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 wire arranged in 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.

❖ **Diagram**:



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b) Network Cable Name: Unshielded Twisted Pair Cable

❖ **Description**:

- An unshielded twisted pair is widely used in telecommunication.
- Ordinary telephone wires.
- Weak immunity against noise & interferences.
- Following are the categories of UTP:
- Category 1: Used for telephone lines that have low-speed data.
- Category 2 & 3: It can support up-to 4Mbps & 16Mbps.
- Category 4: It can support up-to 20Mbps.
- It can be used for long-distance communication.
- Category 5: It can support up-to 200Mbps.

➥ **Advantages:**

- It is cheap.
- Installation of the unshielded twisted pair is easy.
- It can be used for high-speed LAN.
- Disadvantage:
- This cable can only be used for shorter distances because of attenuation

❖ **Diagram**:

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c) Network Cable Name: shielded Twisted Pair Cable

- **Description**:
  - A shielded twisted pair is a cable that contains the mesh surrounding the wire that allows the higher transmission rate.
  - An installation of STP is easy.
  - It has a higher attenuation.
  - It is shielded that provides the higher data transmission rate.
  - It is more expensive as compared to UTP and coaxial cable.
  - It has higher capacity as compared to unshielded twisted pair cable.
  - Used in exterior network (outside of building).
- **Diagram**:

d) Network Cable Name: Coaxial Cable

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

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➢ **Coaxial cable is of two types**:

❖ **Baseband transmission:**
- It is defined as the process of transmitting a single signal at high speed.

❖ **Broadband transmission:**
- It is defined as the process of transmitting multiple signals simultaneously.

➥ **Advantages of Coaxial cable**:

- The data can be transmitted at high speed.
- It has better shielding as compared to twisted pair cable.
- It provides higher bandwidth.

➥ **Disadvantages of Coaxial cable**:
- It is more expensive as compared to twisted pair cable.
- If any fault occurs in the cable causes the failure in the entire network.

❖ **Diagram**:

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e) Network Cable Name: Fiber Optic Cable

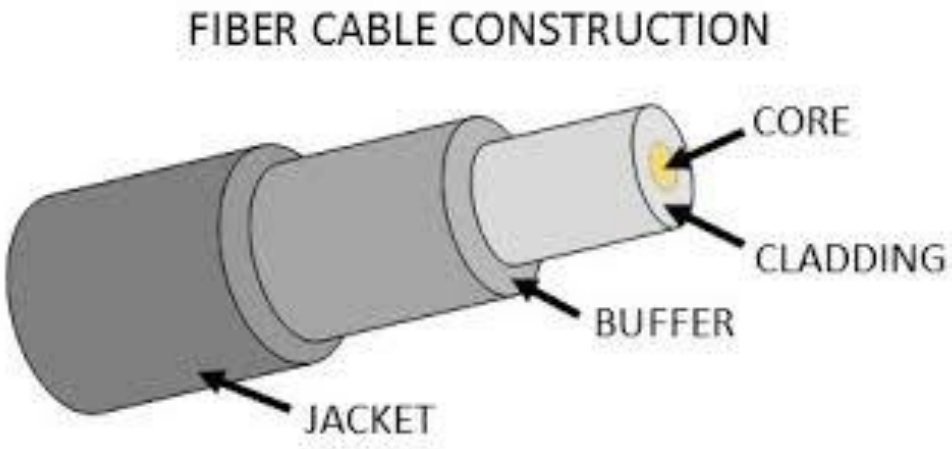
❖ **Description**:

- A fiber-optic cable is made of glass or plastic and transmits signals in the 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 fibre consists of a narrow strand of glass or plastic known as a core.
- **Cladding:** The concentric layer of glass is known as cladding.
- **Jacket:** 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.

➥ **Advantages :**

- It provides faster data transmission than copper wires.
- It carries the data at a longer distance as compared to copper cable.
- Small size & weight.
- Better Reliability.
- Used in high bandwidth network.
- High data rate & lower attenuation.

❖ **Diagram**:



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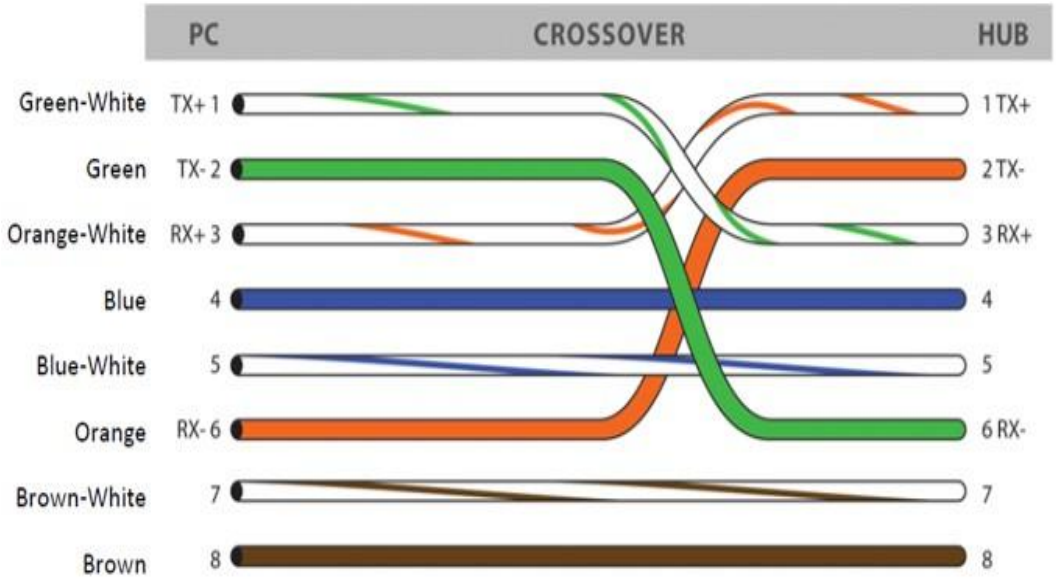
2. Difference between guided and unguided media.

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.
3	Used to perform point-to-point communication.	Unguided media is generally suited for radio broadcasting in all directions.
4	It is affordable.	It is costly.
5	Discrete network topologies are formed by the guided media.	Continuous network topologies are formed by the unguided media.
6	Signals are in the form of voltage, current, or photons in the guided media.	Signals are in the form of electromagnetic waves in unguided media.

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

a) Cross-wired Cable Diagram (Color Code)



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b) Straight Through Cable Diagram (Color Code)