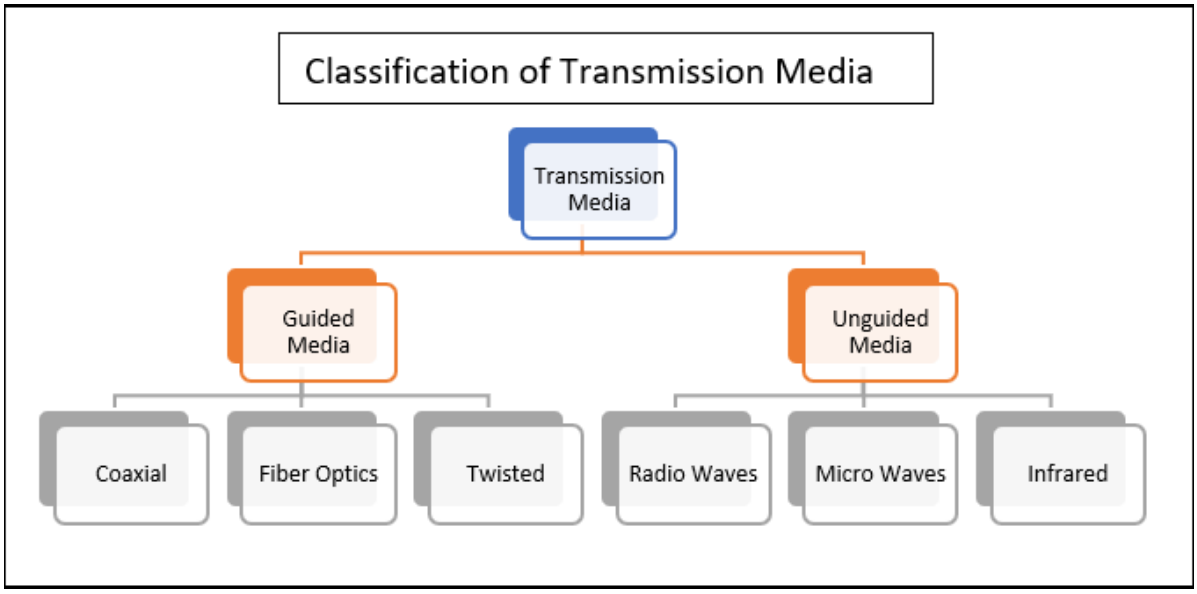
Practical:2

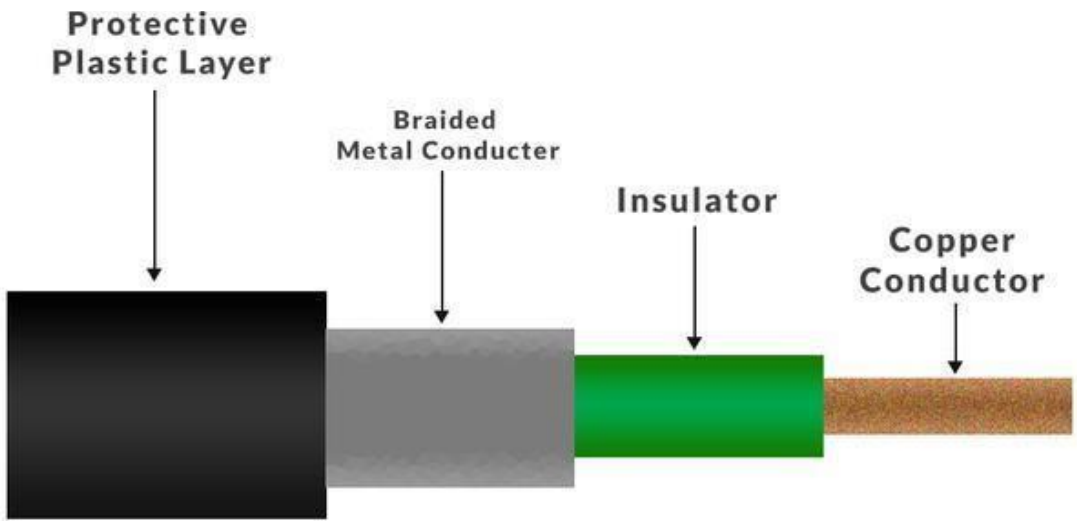
Aim: Demonstrate different types of network cables and practically implement the cross-wired cable and straight through cable

Classfication of Transmission Media:



1. Coaxial Cable:

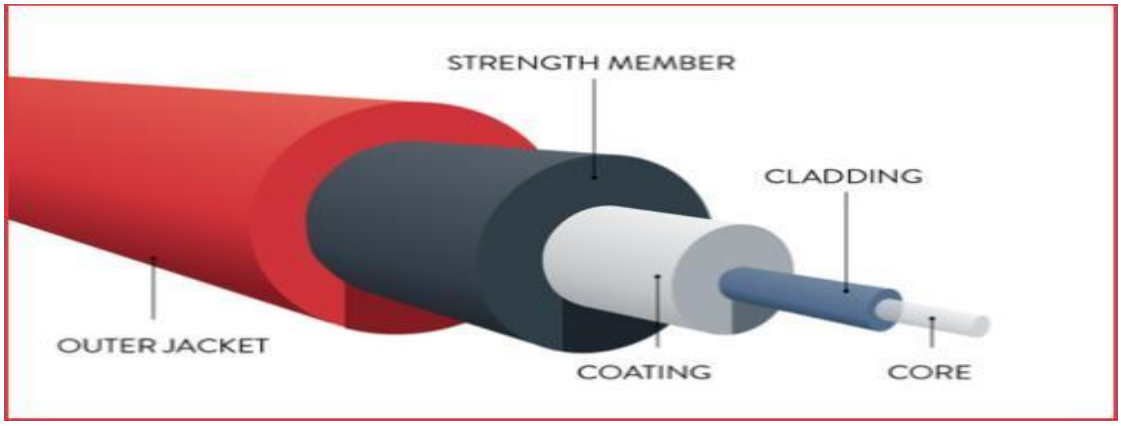
- Coaxial cable is very commonly used in TV.
- The inner conductor is made up of copper, and the outer conductor is made up of copper mesh. The middle core is made up of non-conductive cover
- The middle core is responsible for the data transferring whereas the copper mesh prevents from the EMI(Electromagnetic interference).
- The core copper conductor is used for the transmission of signals and the insulator is used to provide insulation to the copper conductor and the insulator is surrounded by a braided metal conductor which helps to prevent the interference of electrical signals and prevent cross talk. This entire setup is again covered with a protective plastic layer to provide extra safety to the cable.
- A coaxial cable is an electrical cable with a copper conductor and an insulator shielding around it and a braided metal mesh that prevents signal interference and cross talk. Coaxial cable is also known as coax.



-Coxaial Cable

2. Fibre Optic:

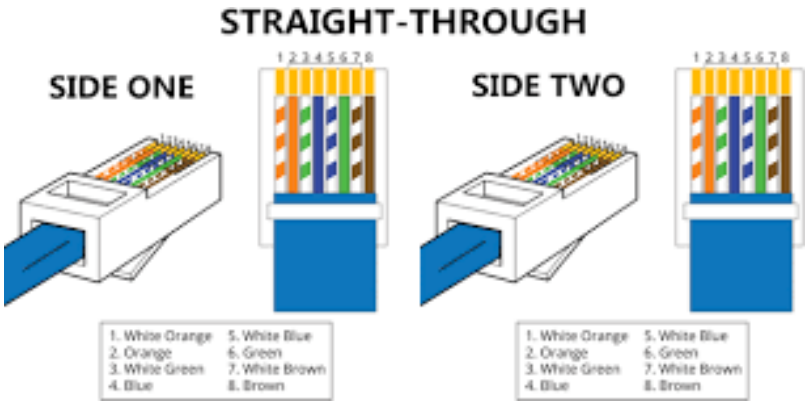
- It uses electrical signals for communication.
- Fiber optic is a cable that holds the optical fibers coated in plastic that are used to send the data by pulses of light.
- The plastic coating protects the optical fibers from heat, cold, electromagnetic interference from other types of wiring.
- Fiber optics provide faster data transmission than copper wires.
- Core: The optical fiber consists of a narrow strand of glass or plastic known as a core. A core is a light transmission area of the fiber. The more the area of the core, the more light will be transmitted into the fiber.
- Cladding: The concentric layer of glass is known as cladding. The main functionality of the cladding is to provide the lower refractive index at the core interface as to cause the reflection within the core so that the light waves are transmitted through the fiber.
- Jacket: The protective coating consisting of plastic is known as a jacket. The main purpose of a jacket is to preserve the fiber strength, absorb shock and extra fiber protection.



-Fibre optic

3. Twisted Cable:
    a) Straight Cable:
        - Wiring Configuration: In a straight cable, the wiring configuration is such that the pins on one end of the cable align with the corresponding pins on the other end. This configuration enables direct communication between devices without the need for crossover or swapping of wires.
        - Usage: Straight cables are commonly used in networking scenarios where one device needs to connect directly to another, such as connecting a computer to a router or a switch to a modem.
        - Connector Types: Straight cables typically use RJ-45 connectors, which are standard connectors for Ethernet cables. These connectors have eight pins that align with the eight wires inside the cable.
        - Color Coding: Ethernet cables often follow a standardized color-coding scheme for the wiring inside. The most common scheme is the TIA/EIA 568B standard, where the wires are arranged in a specific order inside the cable.
        - Compatibility: Straight cables are compatible with most Ethernet-enabled devices, including computers, routers, switches, and modems. They provide a simple and straightforward way to establish a wired network connection.
        - Limitation: While straight cables are useful for connecting devices of different types, they are not suitable for connecting similar devices directly, such as connecting a computer to another computer or a router to

another router. For such connections, a crossover cable is typically used.



-Straight Cable

b) Straight Cable:

- A crossover cable is a type of Ethernet cable that allows for direct connection between two similar devices, such as two computers or two switches, without the need for a network hub or router. Here are 5 to 6 key points about crossover cables:

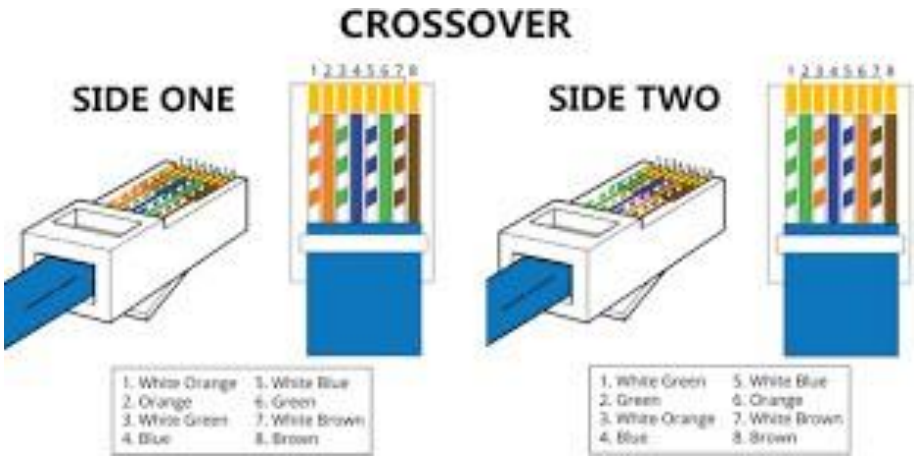
- Purpose: Crossover cables are used to establish a direct network connection between two devices of the same type, such as two computers or two switches, without requiring an intermediary device like a router or a hub.

- Wiring: Unlike standard Ethernet cables, which have a specific wiring arrangement (T568A or T568B) on both ends, crossover cables have a different wiring scheme on one end. This wiring configuration allows the transmit signals of one device to directly connect to the receive signals of the other device.

- Usage: Crossover cables are handy for networking scenarios where a direct connection between two devices is necessary, such as file transfers between computers, setting up a temporary network, or connecting two switches for network expansion.

- Identification: Crossover cables can be identified visually by inspecting the wiring arrangement at each end. Typically, one end follows the standard wiring scheme (T568A or T568B), while the other end has a crossover wiring scheme.

- Limitations: While crossover cables are useful for direct device-to-device connections, they are not suitable for connecting devices of different types (e.g., computer to router). In such cases, a standard Ethernet cable or a switch/router would be required.



-Cross-over Cable

	Hub	**Switch**	**Router**	**PC**
Hub	Crossover	Crossover	Straight	Straight
Switch	Crossover	Crossover	Straight	Straight
Router	Straight	Straight	Crossover	Crossover
PC	Straight	Straight	Crossover	Crossover