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CHAPTER – 13   XII – STD – COMPUTER APPLICATIONS   NETWORK CABLING

Part - II
Short Answers

1. Write a note on twisted pair cable.
It is type of cable with two or more insulated wires twisted together.
This twisted cable has 8 wires which are twisted to ignore electromagnetic interference.

2. What are the uses of USB cables?
USB cables are used connect keyboard, mouse and other peripheral devices.

3. Write a note on the types of RJ45 connector.
☐   An 8-pin/8-position plug or jack is commonly used to connect computers onto Ethernet-based local area networks (LAN).
• Two wiring schemes–T568A and T568B–are used to terminate the twisted-pair cable onto the connector interface.

4. What is an Ethernet port?
The Ethernet port is the jack where the Ethernet cable is to be connected.
This port will be there in both the computers and the LAN port.
It connects Ethernet cable with Ethernet card mounted on motherboard.

5. What is the use of Crimping tool?
The crimping tool is a physical tool which is used to connect the patch wire and the Ethernet connector.
Use the crimping tool to lock the RJ45 connector on the cable.

6. What are the types of twisted pair cables?
Two types of twisted pair cables are Unshielded Twisted Pair (UTP) and Shielded Twisted pair (STP).

7. What is meant by champ connector?
☐   The RJ-21 connector has 50 pins with 25 pins at one end and 25 pins at the other end. It is also called as champ connector or Amphenol connector.
• RJ21 connector uses screws to anchor into place instead of bail locks. Sometimes, it is called a "Champ" connector (referencing a series of connectors made by Amp), or an "Amphenol" connector (referencing the connector manufacturer).

Part - III
Explain in Brief Answer

1. Write a note on crossover cables.

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☐ The first coloured wire at one end of the cable is the third coloured wire at the other end of the cable.

☐ If you require a cable to connect two computers or Ethernet devices directly together without a **hub**, then you will need to use a Crossover cable instead.

☐ Then the pairs (**Tx and Rx lines**) will be crossed which means pin **1 & 2** of the plug on one end are connected with pin **3 & 6** of the plug on other end, and vice versa (**3 & 6 to pin 1 & 2).**

☐ The easiest way to make a crossover cable is to make one end to **T568A** colour coding and the other end to **T568B**.

2. Write a short note on RJ45 connector.

☐ The RJ45 connector is a small plastic cup which will be used to connect the wire inside the connector and ready to connect the Internet.

☐ The RJ45 connector looks similar like a telephone jack but it looks a slightly wider.

☐ The Ethernet cables are sometime called as RJ45 cables.

• In RJ45 the "RJ" stands for the Registered Jack and the "**45**" simply refers to the number of interface standard in the cable.

☐ Each RJ45 connector has eight pins and connected to each end of the Ethernet cable. It has 8-position, 8-contact (**8P8C**) modular plug, It is also known as 8P8C connector

3. What are the differences between serial and parallel ports?

SERIAL PORTS	PARALLEL PORTS
PINS: Serial ports typically are 9 pin or 25 pin	PINS: The parallel port is a 25 pin
Type of Port: Male connectors.	Type of Port: female connector
Devices That Use: The RS232 standard is used by many different manufacturers of devices.	Devices That Use: The parallel cables are used to connect to the printer and other disk drivers
The serial port will send 1 bit at one time	The parallel port will send 13 bit at one time.
Its used for short distance communication	Its used for long distance communication

4. What is meant by null modem cable?

☐ A communication method directly connects two computers without modem or any equipment.

☐ A cable interconnecting two devices directly is known as a null modem cable.

☐ RS232 is one type of serial cable, also known as Null modem cable.

☐ The Crossover Ethernet cable is an example of the Null modem Cables.

☐ Rollover cable is a type of null-modem cable.

5. What are the components involved in Ethernet cabling?

The three main components are used in the Ethernet cabling components are

1. Patch Cable (Twisted pair)   **2.** RJ45 Connector   **3.** Ethernet Ports   **4.** Crimping Tool

6. What are the types of Fibre optic cables?

There are two types of fiber optic cables available, One is single-mode (100BaseBx) another one is Multimode (100BaseSX).

The Single-mode cables are used for long distance transmission and at a high cost

The multimode cables are used for short distance transmission at a very low cost.

Part - IV
Explain in detail

1. What is meant by Registered Jack? Explain briefly the types of Jacks.

Registered Jacks:

A Registered Jack (RJ) is a network interface used for connecting different data equipment and telecommunication devices.

A Registered Jack commonly known as RJ is a network interface used for network cabling, wiring and jack construction.

The **primary** function of the registered jack is to connect different data equipment and telecommunication devices.

The commonly known registered jacks are RJ-11, RJ-45, RJ-21, and RJ-28.

The registered jack refers to the male physical connector (Plug), a female physical connector (Jack) and it's wiring.

1. RJ-11:

It is the most popular modern form of registered jack.

It is found in home and office. This registered jack is mainly used in **telephone and landlines**.

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When we look the pin details of the RJ-11, there are **6** pin where the two pins give the transmission configuration, the two pins give the receiver configuration and the other two pins will be kept for reserved.

The two pin will have the positive terminal and the negative terminal.

2. RJ-14 and RJ-61:

The RJ-14 is the same as RJ-11 which will be used for **telephone lines** where same it as 6 pins whereas the RJ-61 will have **8** pins.

This RJ-61 will use the twisted pair cable with a modular 8 connection.

Four-wire RJ-11 connectors (**6P4C**) are commonly used for telephone handsets and wall outlets. The six-wire variation (**6P6C**) is used for three telephone lines

3. RJ-21:

The RJ-21 connector has **50** pins with **25** pins at one end and **25** pins at the other end. It is also called as **champ connector or Amphenol connector**.

The Amphenol is a connector manufacturer.

The RJ-21 interface is typically used for data communication **trucking** applications.

2. Explain wiring techniques used in Ethernet cabling.

There are three types of wiring techniques to construct the Ethernet cable.

It is also known as color coding techniques. They are

● Straight-Through Wiring ● Cross-over Wiring ● Roll-over Wiring

Straight-through: The coloured wires are in the same sequence at both ends of the cable.

The Ethernet cables used for Ethernet connections are "straight through cables".

which means that pin 1 of the plug on one end is connected to pin 1 of the plug on the other end (for both standard – **T568A & T568B**).

The straight through wiring cables are mostly used for connecting PC / NIC card to a hub.

This is a simple physical connection used in printers, computers and other network interfaces.

Cross-over: The first coloured wire at one end of the cable is the third coloured wire at the other end of the cable.

If you require a cable to connect two computers or Ethernet devices directly together without a hub, then you will need to use a Crossover cable instead.

Then the pairs(**Tx and Rx lines**) will be crossed which means pin **1 & 2** of the plug on one end are connected with pin **3 & 6** of the plug on other end, and vice versa (**3 & 6 to pin 1 & 2).**

The easiest way to make a crossover cable is to make one end to **T568A** colour coding and the other end to **T568B**.

Roll-over: The coloured wires are in the opposite sequence at either end of the cable.

Rollover cable is a type of null-modem cable that is often used to connect a device console port to make programming changes to the device.

The coloured wires are reversed on other end i.e. The pins on one end are connected with other end in reverse order (i.e. pin 1 to 8, 2 to 7, 3 to 6, 4 to 5, 5 to 4, 6 to 3, 7 to 2, 8 to 1).

Rollover cable is also known as **Yost** cable or **Console** cable.

3. Explain about RJ45 connector.

☐   The RJ45 connector is a small plastic cup which will be used to connect the wire inside the connector and ready to connect the Internet.

☐   The RJ45 connector looks similar like a telephone jack but it looks a slightly wider.

☐   The Ethernet cables are sometime called as RJ45 cables.

● In RJ45 the "RJ" stands for the Registered Jack and the "**45**" simply refers to the number of interface standard in the cable.

☐   Each RJ45 connector has eight pins and connected to each end of the Ethernet cable.

☐   It has 8-position, 8-contact (**8P8C**) modular plug, It is also known as 8P8C connector.

☐   The cables together with male connectors (**RJ45**) on each end are commonly referred as Ethernet cables.

☐   It is also called as RJ45 cables, since Ethernet cable uses RJ45 connectors.

☐   The RJ45 connector has eight small jack inside to connect eight small wires of the patch cable.

● The eight cables are in eight different colors. Let's discuss that eight colors and where does that eight colors connect to the RJ45 connector.

4. Explain the components used in Ethernet cabling.

The three main components are used in the Ethernet cabling components are

1. Patch Cable (Twisted pair)   **2.** RJ45 Connector   **3.** Ethernet Ports   **4.** Crimping Tool

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i. Patch Cable (Twisted Pair)

These Cables are generally made up of 8 wires in different colors.

☐ Four of them are solid colours, and the others are striped.

☐ The eight colors are white green, green, white orange, blue, white blue, orange, white brown and brown.

☐ Ethernet cables are normally manufactured in several industrial standards such as Cat 3, Cat 5, Cat 6, Cat 6e and cat 7.

• "Cat" simply stands for "Category," and the following number indicates the version.

☐ A crossover Ethernet cable is specially designed for making a connection between two computers.

ii. RJ45 Connector

☐ The RJ45 connector is a small plastic cup which will be used to connect the wire inside the connector and ready to connect the Internet.

☐ The RJ45 connector looks similar like a telephone jack but it looks a slightly wider.

☐ The Ethernet cables are sometime called as RJ45 cables.

• In RJ45 the "RJ" stands for the Registered Jack and the "**45**" simply refers to the number of interface standard in the cable.

☐ Each RJ45 connector has eight pins and connected to each end of the Ethernet cable.

☐ It has 8-position, 8-contact (**8P8C**) modular plug, It is also known as 8P8C connector.

iii. Ethernet card and Port

☐ Ethernet card is a Network Interface Card (NIC) that allows computers to connect and transmit data to the devices on the network.

☐ It may be an expansion card or built-in type.

Expansion card is a separate circuit board also called as PCI Ethernet card which is inserted into PCI slot on motherboard of a computer.

☐ Now a days most of the computers come with built-in Ethernet cards which resides on motherboard to connecting the device to a wired network, Wireless Ethernet cards are also available, which uses radio waves to transmit data

Ethernet Port

☐ Ethernet port is an opening which is a part of an Ethernet card.

☐ This **port** can be **used** to connect your computer to another computer, a local network, or an external DSL or cable modem.

☐ Once you inject the plug into the port the two led lights will glow in the computer; the one is green and another one is orange.

☐ The orange light will start blinks then it means the Internet is connected.

iv. Crimping Tool

Crimping is the process of joining two or more pieces of metal or wire by deforming one or both of them to hold each other.

Joining RJ45 connector together with twisted pair cable at each end is an essential process in Ethernet cabling which lead the cable to function properly

5. Explain the types of network cables

i. Coaxial Cables:

☐ Coaxial cables are used for connecting the television with setup box.

☐ This cable is used to transfer the information in 10 mbps.

☐ Two type of coaxial cable.

The cable is divided into thinnet and thicknet cables.

☐ Thicknet can be upto meters long.

☐ Thinnet using this cable max. Distance of 185 meters can be joined.

☐ Some of the cable names are Media Bridge 50-feet Coaxial cable, Amazon basics CL2-Rated Coaxial cables, etc.

Advantage:

☐ These cables have a copper wire inside and insulation is covered on the top of the copper wire to provide protection to the cable

Disadvantage:

☐ These cables are very difficult to install and maintain, because they are too big to carry and replace.

ii. Twisted Pair Cables:

☐ Twisted cable has 13 wires which are twisted to ignore electromagnetic interference

☐ This twisted cable has 8 wires which are twisted to ignore electromagnetic interference.
☐ Two types of twisted pair cables are Unshielded Twisted Pair (UTP) and Shielded Twisted pair (STP).
☐ The UTP is used nowadays as modern cables for Internet and they are lower in cost and installation and maintenance is easy compared to the coaxial cables.
☐ STP is similar to UTP, but it is covered by an additional jackets to protect the wires from External interference.

iii. Fiber Optics:

☐ This cable is different from the other two cables.
☐ The other two cables had an insulating material at the outside and the conducting material like copper inside.
☐ cable it is of strands of glass and pulse of light is used to transmit the information from one place to another
☐ They are mainly used in Wide Area Network (WAN).
☐ There are two types of fibre optic cables are available are Single mode (100BaseBx) and Multimode (100BaseSX).

Single-mode cables are used for long distance transmission and at a high cost.
The multimode cables are used for short distance transmission at a very low cost.

iv. USB Cables: The Universal Serial Bus are used to connect keyboard, mouse and other peripheral devices. But there are some special network devices used to connect the Internet through the USB called dongles.
☐ The dongle is a small peripheral device which has a compatible of mobile broadband with a sim slot in it and connects the Internet and acts as a modem to the computer.

v. Serial and Parallel cables:

SERIAL PORTS	PARALLEL PORTS
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Its used for short distance communication	Its used for long distance communication

vi. Ethernet Cables:

☐ Ethernet cable is the most common type of network cable mainly used for connecting the computers or devices at home or office.
☐ This cable connects wired devices within the local area network (LAN) for sharing the resources and accessing Internet.

BOOK INSIDE

What is computer networking?
Computer Networking is a group of interconnected computers or other devices for sharing the data and resources among them.

Two type of computer networks.
Computers can be connected on the network with the help of wired media (Unshielded Twisted pair, shielded Twisted pair, Co-axial cables and Optical fibre) or wireless media (Infra Red, Bluetooth, WiFi)

Wired networks
Wired networks are still used widely in the offices where need increased speed and secure connections.

Wireless networks
Wireless networks enable more devices including mobiles sharing the resources and Internet connections remotely.