

BITT

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Branch: E.C.E

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Subject: Data Communication & Computer Networking

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Objective question (The correct option is bolded)

1. The physical layer is concerned with _____
 - a) **bit-by-bit delivery**
 - p) process to process delivery
 - c) application to application delivery
 - d) port to port delivery
2. Which transmission media provides the highest transmission speed in a network?
 - a) coaxial cable
 - b) twisted pair cable
 - c) **optical fiber**
 - d) electrical cable
3. Bits can be sent over guided and unguided media as analog signal by _____
 - a) **digital modulation**
 - b) amplitude modulation
 - c) frequency modulation
 - d) phase modulation
4. The portion of physical layer that interfaces with the media access control sublayer is called _____
 - a) **physical signalling sublayer**
 - b) physical data sublayer
 - c) physical address sublayer
 - d) physical transport sublayer
5. The physical layer provides _____
 - a) mechanical specifications of electrical connectors and cables
 - b) electrical specification of transmission line signal level
 - c) specification for IR over optical fiber
 - d) **all of the mentioned**
6. In asynchronous serial communication the physical layer provides _____
 - a) start and stop signalling
 - b) flow control

- c) **both start & stop signalling and flow control**
 - d) only start signalling
7. The physical layer is responsible for _____
- a) line coding
 - b) channel coding
 - c) modulation
 - d) **all of the mentioned**
8. The physical layer translates logical communication requests from the _____ into hardware specific operations.
- a) **data link layer**
 - b) network layer
 - c) transport layer
 - d) application layer
9. A single channel is shared by multiple signals by _____
- a) analog modulation
 - b) digital modulation
 - c) **multiplexing**
 - d) phase modulation
10. Wireless transmission of signals can be done via _____
- a) radio waves
 - b) microwaves
 - c) infrared
 - d) **all of the mentioned**

Short Question

1. What do you mean by Automatic Repeat Request (ARQ)?

ARQ means retransmission of data in three cases:

- Damaged Frame
- Lost Frame
- Lost Acknowledge

2. What are the responsibilities of Data Link Layer?

The Data Link Layer transforms the physical layer, a raw transmission facility, to a reliable link and is responsible for node-node delivery.

- Framing
- Physical Addressing
- Flow Control
- Error Control
- Access Control

3. What are the three protocols used for noisy channels?

The three protocols used for noisy channels

1. Stop – and – Wait ARQ
2. Go – back – N ARQ
3. Selective Repeat ARQ

4. What is CSMA/CD?

Carrier Sense Multiple Access with Collision Detection is a protocol used to sense whether a medium is busy before transmission and it also has the ability to detect whether the packets has collided with another

5. What are the various types of connecting devices?

There are five types of connecting devices

1. Repeaters
2. Hubs
3. Bridges
4. Routers
5. Switches.

6. Define Flow control

It refers to a set of procedures used to restrict the amount of data the sender can send before waiting for an acknowledgement

7. What are the categories of Flow control?

The categories of Flow control are

- Stop& wait
- Sliding Window

8. Mention the disadvantages of stop& wait.

- Inefficiency
- Slow process

9. What are the functions of data link layer?

The functions of data link layer are

- Flow control
- Error control

10. Define Link Discipline

It coordinates the link system. It determines which device can send and when it can send.

Long Question

1. Explain the different types of computer network.

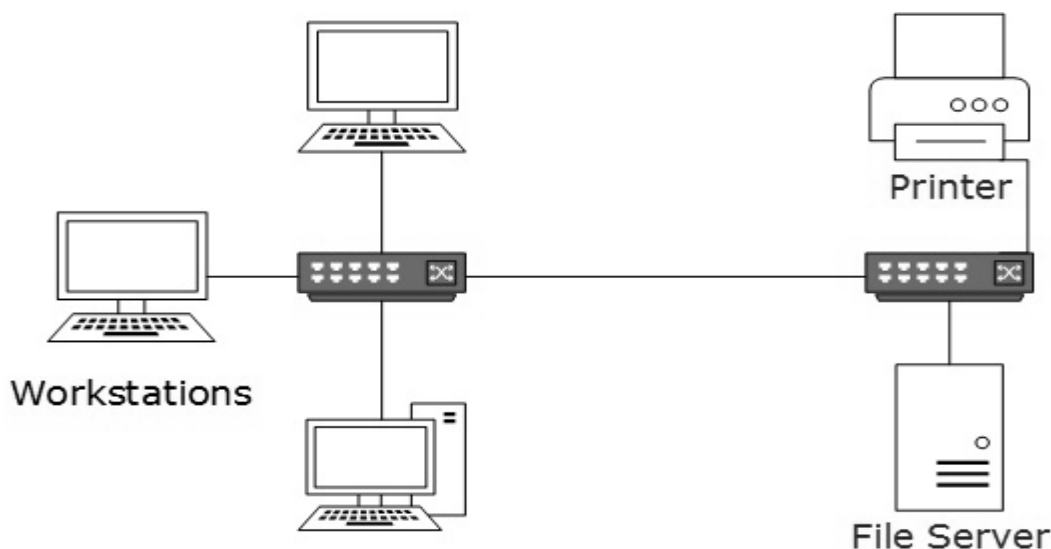
Answer: The different types of computer network are:

- i) Local Area Network (LAN)
- ii) Metropolitan Area Network (MAN)
- iii) Wide Area Network (WAN)

i) Local Area Network (LAN)

A computer network spanned inside a building and operated under single administrative system is generally termed as Local Area Network (LAN). Usually, LAN covers an organization offices, schools, colleges or universities. Number of systems connected in LAN may vary from as least as two to as much as 16 million.

LAN provides a useful way of sharing the resources between end users. The resources such as printers, file servers, scanners, and internet are easily sharable among computers.



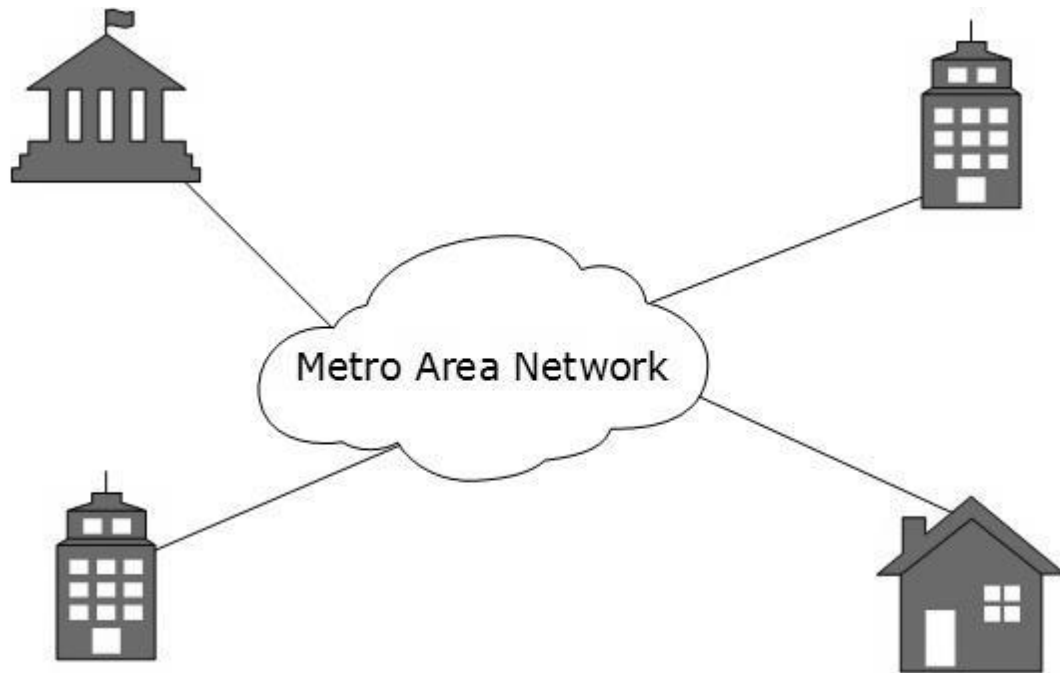
LANs are composed of inexpensive networking and routing equipment. It may contain local servers serving file storage and other locally shared applications. It mostly operates on private IP addresses and does not involve heavy routing. LAN works under its own local domain and is controlled centrally.

LAN uses either Ethernet or Token-ring technology. Ethernet is most widely employed LAN technology and uses Star topology, while Token-ring is rarely seen.

LAN can be wired, wireless, or in both forms at once.

ii) **Metropolitan Area Network (MAN)**

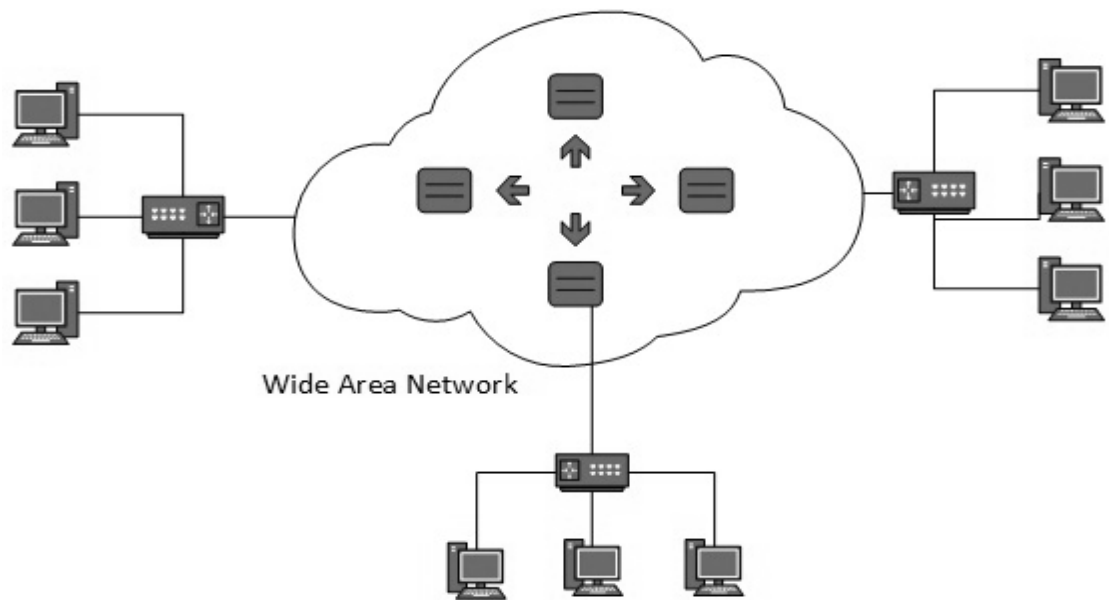
The Metropolitan Area Network (MAN) generally expands throughout a city such as cable TV network. It can be in the form of Ethernet, Token-ring, ATM, or Fiber Distributed Data Interface (FDDI). Metro Ethernet is a service which is provided by ISPs. This service enables its users to expand their Local Area Networks. For example, MAN can help an organization to connect all of its offices in a city.



Backbone of MAN is high-capacity and high-speed fiber optics. MAN works in between Local Area Network and Wide Area Network. MAN provides uplink for LANs to WANs or internet.

iii) **Wide Area Network (WAN)**

As the name suggests, the Wide Area Network (WAN) covers a wide area which may span across provinces and even a whole country. Generally, telecommunication networks are Wide Area Network. These networks provide connectivity to MANs and LANs. Since they are equipped with very high speed backbone, WANs use very expensive network equipment.

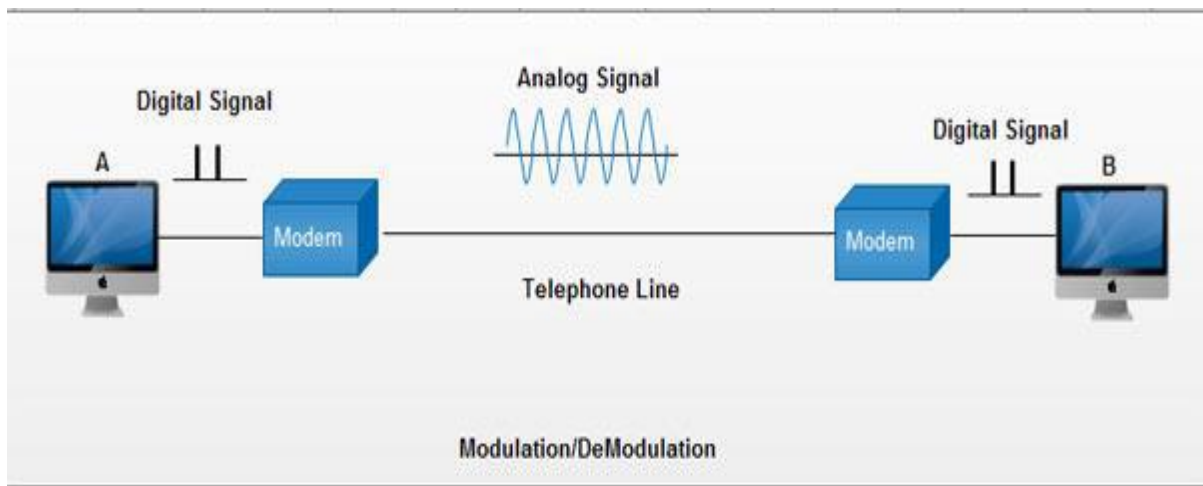


WAN may use advanced technologies such as Asynchronous Transfer Mode (ATM), Frame Relay, and Synchronous Optical Network (SONET). WAN may be managed by multiple administration.

2. Explain the concept of MODEM.

Answer: Modem is abbreviation for Modulator – Demodulator. Modems are used for data transfer from one computer network to another computer network through telephone lines.

- The computer network works in digital mode, while analog technology is used for carrying messages across phone lines.
- Modulator converts information from digital mode to analog mode at the transmitting end and demodulator converts the same from analog to digital at receiving end.
- The process of converting analog signals of one computer network into digital signals of another computer network so they can be processed by a receiving computer is referred to as digitizing.



Modems can be of several types and they can be categorized in a number of ways.

Categorization is usually based on the following basic modem features:

- 1. Directional capacity: half duplex modem and full duplex modem.
- 2. Connection to the line: 2-wire modem and 4-wire modem.
- 3. Transmission mode: asynchronous modem and synchronous modem.

Categories of modem

- External modem
- Internal modem

Any external modem is attached to any computer has an RS-232 port.

An internal modem comes as an expansion board that can be inserted into a vacant expansion slot.

Types of modem

- Standard fax modem
- Digital cable modem
- ISDN modem
- Digital subscribes line modem
- Satellite modem