
Short Questions

Q.1. Define data communication.

Data communication is a process of transferring data electronically from one place to another. Data can be transferred by using different medium.

Q.2. List out different elements of data communication.

The basic elements of data communication are message, sender, receiver, medium and Encoder and Decoder.

Q.3. What is the role of sender in data communication?

Sender is the device that sends the message. It is also called source or transmitter. The sender can be a computer, fax machine or mobile phone etc. The computer is usually used as sender in data communication systems.

Q.4. What is the role of receiver in data communication?

Receiver is the device that receives the message. It is also called sink. The receiver must be capable of accepting the message. The receiver can be a computer, printer, fax machine or mobile phone etc. A computer is usually used as receiver in data communication systems.

Q.5. Differentiate between sender and receiver.

Sender is a device that sends the data message. It is also called source. Sender is normally a computer. Receiver is a device that receives message. It can be computer, printer, or another computer related device. The receiver must be capable of accepting the message.

Q.6. How are messages transferred in data communication?

Transmission medium is the path through which the messages are transferred. It is used to carry messages from one place to another. It is also called communication channel. The transmission medium is a physical cable or wireless connection.

Q.7. Define the term Encoder and Decoder.

Encoder is a device that converts digital signals in a form that can pass through a transmission medium. Decoder is a device that converts the encoded signals into digital form. Sender and receiver cannot communicate successfully without encoder and decoder.

Q.8. How media is important in communication?

Communication network cannot exist without a medium. The medium is used to connect the source and receiver and provide path to send messages.

Q.9. What is signal?

Signal is an electromagnetic or light wave that represents data. Signals are used to transfer data from one device to another through a communication medium.

Q.10. What is digital signal?

Digital signal is a sequence of voltage represented in binary form. Digital signals are in the form of electrical pulses of ON and OFF. These signals are in discrete form. Digital signals are faster and efficient. All data communication between computers are in digital form.

Q.11. What is Analog signal?

Analog signal is a continuous electrical signal in the form of wave. The wave is known as carrier wave. Sound wave is an example of analog signal. Analog signal is measured in volts and its frequency is in Hertz (Hz).

Q.12. Write are two characteristics of analog signal.

Two characteristics of an analog wave are frequency and amplitude. The number of times a wave repeats during a specific time interval is known as frequency. The height of wave within a given period of time is known as amplitude.

Q.13. Differentiate between analog and digital signal. Which is popular?

Analog signal is a continuous electrical signal in the form of wave. Sound wave is an example of analog signal. Digital signal is a sequence of voltage represented in binary form. Digital signals are popular. They provide lower error rates, higher transmission speed and higher quality voice transmission.

Q.14. How is data represented in computer?

Computer works with binary numbers. Binary number may be 0 or 1. The data inside the computer is represented as electrical pulses. The binary digit 1 indicates the presence of electrical pulse. The binary digit 0 indicates the absence of electrical pulse.

Q.15. Define bit and byte.

A binary digit is called bit. It takes one storage location in memory. A collection of eight bits is called byte. It is used to store single character.

Q.16. Write different encoding characters used to represent data in computer.

The process of converting data into binary form is known as encoding. Data can be converted into binary form by using different encoding techniques. These are BCD Code, EBCDIC Code, ASCII and Unicode.

Q.17. What is ASCII code?

ASCII is the most widely used coding scheme for personal computers. The 7-bit code can represent 128 characters. It is not enough to represent some graphical characters displayed on computer screens. An 8-bit code can represent 256 characters. The extended 128 unique codes represent graphic symbols.

Q.18. Why does ASCII code only provide 256 character combinations?

It is an 8-bit code and $2^8 = 256$.

Q.19. What is Unicode?

Unicode is a 16-bit code. It can represent 65536 characters. It has started to replace ASCII code. It can represent the characters of all languages in the world.

Q.20. Why Unicode is superior to ASCII code.

ASCII code uses 8 bit. It is limited to 256 different characters. Unicode uses 16 bits. It allows over 65,000 codes. It can represent all major languages.

Q.21. What are transmission modes?

The way in which data is transmitted from one place to another is called data transmission modes. Simplex, half duplex and full duplex are modes of data transmission.

Q.22. How does data flow in simplex mode?

In simplex mode, data can flow only in one direction. It operates in a manner similar to a one-way street. The direction of flow never changes. A device with simplex mode can either send or receive data. Traditional television broadcast is an example of simplex mode.

Q.23. How does data flow in half duplex mode?

In half-duplex mode, data can flow in both directions but not at the same time. It is transmitted one-way at one time. A device with half-duplex mode can send or receive data but not at the same time. So, the speed of half-duplex mode is slow. Internet surfing is an example of half duplex transmission.

Q.24. Compare simplex and half duplex mode.

In simplex mode, data can flow only in one direction. Radio and television broadcasting are the examples of this mode. In half-duplex mode, data can flow in both directions but not at the same time.

Q.25. How does data flow in full duplex mode?

In full-duplex mode, data can travel in both directions simultaneously. Full duplex mode is faster way of data transmission than half duplex. Time is not wasted in changing the direction of data flow. Telephone conversation is an example of full duplex mode.

Q.26. What do you know about parallel data transmission?

A method of transmission in which groups of bits are sent at same time over multiple wires is called parallel transmission. It is usually unidirectional. Each bit is transmitted over a separate line. Data transmission between computer and printer is a parallel transmission.

Q.27. What is serial data transmission?

A method of transmission in which data is sent one bit at a time is called serial transmission. Telephone lines use this method of data transmission. Each individual bit of information travels along its own communication path.

Q.28. Differentiate between serial and parallel transmission.

Parallel transmission is faster because all bits are sent at the same time. Serial transmission is slower than parallel transmission because data is sent sequentially one bit at a time. Each individual bit of information travels along its own communication path.

Q.29. How is data transmitted in asynchronous transmission?

In asynchronous transmission, data is transmitted character by character. There are irregular gaps between characters. It uses flow control instead of clock to synchronize data between source and destination. It is cheaper because data is not saved before it is sent.

Q.30. How is data transmitted in synchronous transmission?

In synchronous transmission, saved data is transmitted block by block. Each block may consist of many characters. It uses a clock to control timing of bits being sent. Synchronous transmission is much faster than asynchronous because there is no gap between characters.

Q.31. Which transmission mode uses a special start signal and how?

The asynchronous transmission uses a special start signal. A start bit has a value of 0. The value of 0 indicates that a character is about to be transferred. It alerts the receiver and it gets ready to receive the character. If start bit has a value 1, it indicates that the line is idle.

Q.32. Compare asynchronous and synchronous transmission.

In asynchronous transmission, data is transmitted one character at a time. The sender and receiver are not synchronized with each other. Synchronous transmission sends a block of characters at a time. It allows sender and receiver to be synchronized with each other. Synchronous transmission is typically more efficient than asynchronous communications.

Q.33. Differentiate between bounded & unbounded communication.

In bounded media, communication devices are directly connected via physical media like wires. Coaxial cable and fiber optics are examples of bounded media. In unbounded media, communication devices communicate through air or space using broadcast radio signals etc. Microwave and satellite are examples of unbounded media.

Q.34. Name some bounded media.

Some examples of bounded media are wire pairs, coaxial cable and fiber optics.

Q.35. Name some unbounded communication media.

Some examples of unbounded communication media are microwave system and communication satellite.

Q.36. What is wire pair?

Wire pair is a communication media made up of copper. Wire pair is usually made up of copper. The pair of wires is twisted together. It is used for short distance digital data communication. Its speed is 9600 bits per second in a distance of 100 meter.

Q.37. What is coaxial cable?

Coaxial cable consists of a copper wire core covered by insulating material. The insulated copper wire is covered by copper mesh. It protects the cable from electromagnetic waves. It is used for long-distance telephone lines and local area networks.

Q.38. What is fiber optics?

Fiber optics use binary method of data transfer. It is made up of a thin glass fiber. It is thinner than hair. Data transfer rate of fiber optics is very fast. There is no chance of data loss.

Q.39. Write two advantages and two disadvantages of fiber optics cable.

The advantages are that it provides faster data transmission and better security for signal during transmission. The disadvantages are that it is difficult to install and very costly.

Q.40. Define refraction.

An important characteristic of fiber optics is refraction. Refraction is a characteristic of a material to pass or reflect light.

Q.41. What is the role of core and cladding in optical fiber?

The core carries the light signal. Cladding reflects the signal back into the core with perfect internal reflection so that no light escapes from the core.

Q.42. Write a short note on microwave transmission.

Microwaves are radio waves that are used to provide high-speed transmission. Data is transmitted through the air from one microwave station to another similar to radio signals. Microwave uses line-of-sight transmission.

Q.43. How does microwave system work?

Microwave uses line-of-sight transmission. It means that the signals travel in straight path and cannot bend. Microwave stations are placed within 20 to 30 miles to each other. Each station receives signal from previous station and transfer to the next station.

Q.44. What is the disadvantage of microwave system?

A disadvantage of microwave is that it is limited to line-of-sight transmission. This means that Microwave signals must be transmitted in a straight line. There can be no obstruction such as buildings or mountains, between microwave stations.

Q.45. What is communication satellite?

Communication satellite is a space station. It receives microwave signals from earth station. It amplifies the signals and retransmits them back to earth. It is established in space about 22,300 miles above the earth.

Q.46. Write one advantage and one disadvantage of communication via satellite.

The advantage is that a satellite can allow long distance wireless communications. The disadvantage is the high cost to put a communications satellite in orbit.

Q.47. Which units are used to measure the transmission rate of modems?

The unit of measure is bits per second (bps).

Q.48. Define modulation. Why is it necessary?

The process of converting digital signal into analog signal is called modulation. Computer stores data in digital form. Since a modem transmits data using telephone line, so it is converted from digital to analog form.

Q.49. Define demodulation. Why is it necessary?

The process of converting analog signal into digital signal is called demodulation. The modem on receiving computer receives data in analog form. The incoming analog data is converted back into digital format to be used by the computer.

Q.50. How does a modem allow computers to communicate over telephone lines?

Modem translates computer data into signals compatible with the telephone system.

Q.51. What is baseband?

Baseband is a communications technique in which digital signals are placed on the transmission line without change in modulation. It transmits up to a couple of miles. It does not require complex modems. Digital signals are commonly called baseband signals.

Q.52. What is broadband?

Broadband is a technique to transmit large amounts of data over long distance. It can send data by modulating each signal onto a different frequency. It transmits several streams of data simultaneously using FDM (Frequency Division Multiplexing) technique.

Q.53. Compare broadband and baseband transmission.

In broadband transmission, data is carried on high-frequency carrier waves. Several channels may be transmitted over a single cable. It allows one medium to be used for a variety of transmission needs. Baseband transmission does not use a carrier wave. It sends data along channel by voltage fluctuations. It cannot transmit multiple channels on one cable but it is less expensive than broadband as it can use less expensive cable and connectors.

Q.54. How does FDM work?

FDM stands for Frequency Division Multiplexing. It divides the bandwidth of a communication line into smaller frequency bandwidths. Each part of the communication line can be used for transmitting data separately.

Q.55. How is external modem attached to the computer?

External modem is attached to the system unit as an external device through telephone line. This modem is connected to computer using serial cable to COM1 or COM2 port. It requires external power supply. It is easy to setup.

Q.56. What do you know about internal modem?

Internal modem is a circuit board that is inserted into an expansion slot on the motherboard. It cannot be moved from one computer to another easily. It is difficult to setup than other types of modem.

Q.57. What do you know about wireless modem?

Wireless modem transmits the data signals through air instead of cable. It is also known as radio-frequency modem. It is designed to work with cellular technology and wireless local area networks.

Q.58. What is start signal? Write its different states.

Asynchronous transmission uses a special start signal. It is transmitted at the start of each message. It is sent when the character is about to be transmitted. A start bit has a value of 0. It is called space state. If the start bit has the value 1, it indicates that the line is idle.

Computer works only with binary numbers. It stores all types of data in the form binary digits. The data is converted to binary form before it is stored inside the computer. The process of converting data into binary form is known as encoding. Data can be converted into binary form by using different coding schemes.

1. The process of transferring data electronically from one place to another is called:
a. Data processing
b. Data Communication
c. Data sequencing
d. Data Sender
2. All of the following are elements of data communication system EXCEPT.
a. Sender
b. Receiver
c. Medium
d. Voltage
3. What is required to send data, instructions or information?
a. Sending device
b. Receiving device
c. Both a & b
d. None
4. Physical path that connects the source and receiver is known as:
a. Communication Channel
b. Decoder
c. Encoder
d. Self-testing
5. The electromagnetic or light waves representing data are called:
a. Information
b. Signal
c. Sender
d. None
6. The number of times a wave repeats during a specific time interval is called:
a. Pulse
b. Amplitude
c. Frequency
d. Oscillation
7. The height of wave within a given period of time is known as:
a. Frequency
b. Amplitude
c. Oscillation
d. Pulse
8. The chart, graph, pictures and freehand drawing are examples of:
a. Image data
b. Audio data
c. Numeric data
d. Text data
9. The music and speech represent:
a. Image
b. Text
c. Numeric
d. Audio
10. Which of the following type of data is used to display actions and movement?
a. Audio
b. Video
c. Image
d. Text
11. Which type of data consists of words, sentences and paragraphs?
a. Text
b. Audio
c. Numeric
d. Video
12. Which of the following coding scheme uses 4-bit code?
a. ASCII
b. EBCDIC
c. BCD
d. Unicode
13. Which of the following coding scheme used by IBM?
a. ASCII
b. EBCDIC
c. BCD
d. Unicode
14. How many characters ASCII 7-bit code can represent?
a. 128
b. 256
c. 500
d. 364