Unit 3: Data Communication

Q1: What is data communication?

Ans: Communication means the exchange of information or messages. The process location to another is called data communication.

Q2: Write names of different elements of data communication system.

Ans: The basic components which are used in data communication system are:

1. Message
2. Sender
3. Medium
4. Receiver
5. Encoder
6. Decoder

Q3: What is message?

Ans: The message is the information or data that is to be communicated. It may be in the form of text numbers pictures, sounds, videos or any combination of these.

Q4: What is sender?

Ans: A device that is used for sending messages is called a sender. It is also called a transmitter. A sender may be computer, fax machine, telephone or camera etc.

Q5: What is Receiver?

Ans: A device that is used for receiving messages called receiver. It may be a computer, a workstation, a printer or television etc.

Q6: What is meant by Communication Medium?

Ans: The path through which data is transmitted from one location to another is called transmission medium. It is also called communication channel. It may be a wire, fiber optics, telephone line etc.

Q7: What is Encoder?

Ans: The encoder is an electronic device that converts digital signals in a form that can pass through a transmission medium.

Q8: What is Decoder?

Ans: The decoder is an electronic device that converts signals from encoded form into digital form that are understandable for receiver.

Q9: Define Signals.

Ans: The data is transmitted from one place to another in the form of electromagnetic or light waves through communication medium. The electromagnetic or light waves representing data are called signal.

Q10: What are Analog Signals?

Ans: The analog signals are continues electrical signals in the form of waves. These waves are called carrier waves. The light waves, sound waves or radio waves are examples of analog signals.

Q11: What are digital signals?

Ans: A digital signal is a sequence of voltage represented in binary form. Actually, digital signals are on-off electrical pulses in discontinuous form (or in discrete form). Most of the computers are digital. Data is represented inside these computers in the form of binary numbers.

Q12: What is meant by encoding of data?

Ans: A computer accepts and processes data in binary form. Therefore, all data (numeric or non-numeric) must be converted into binary form before entering inside the computer. The process of converting data into binary form is called encoding of data.

Q13: What is EBCDIC Code?

Ans: EBCDIC stands for Extended Binary Coded Decimal Interchange Code. It is an 8-bit code. In this binary coding system, (28 = 256) 256 different characters can be represented inside the computer. It is used by IBM (International Business Machine) mainframe computers.

Q14: What is ASCII Code?

Ans: ASCII stands for American Standard Code for Information Interchange. It was developed by American National Standards Institute (ANSI). It is a standard code to represent alphanumeric data.

Q15: What do you know about Unicode?

Ans: Unicode stands for Universal code. It is a 16-bit code. It can represent 65536(216 = 65536) characters or symbols. It is developed by following the ASCII coding scheme. The first identical to the 256 codes used by ASCII system.

Q16: What is BCD code?

Ans: It stands for Binary Coded Decimal. It is a 4-bit code. It means binary digits. It was used by early computers.

Q17: Write any five types of data.

1. Text
2. Numeric Data
3. Audio
4. Video

Q18: What are the Modes of Data Communication?

Ans: The way in which data is transmitted from one place to another is called data transmission mode. It is also called the data communication mode. It indicates the direction of flow of information. Sometimes data transmission modes are also referred to as directional modes.

Q19: What is Simplex Mode?

Ans: In simplex mode, data is transmitted only in one direction. A device with simplex mode can either send or receive data. The television broadcast is an example of simplex mode.

Q20: What is Half Duplex Mode?

Ans: In half duplex mode, data can be transmitted in both directions but only in one direction at a time. The speed of half-duplex is slow. Internet surfing is an example of half-duplex transmission.

Q21: What is Full Duplex mode?

Ans: In full duplex mode, data can be transmitted in both directions at the same time on the same channel. It is the fastest directional mode of communication. The telephone communication system is an example of full duplex communication mode.

Q22: What is Parallel Transmission?

Ans: In parallel transmission, a group of bits of data flow at the same time (in parallel) through separate communication lines. It is very fast data transmission. The automobile traffic on a multi-lane highway is an example of parallel transmission.

Q23: What is Serial Transmission?

Ans: In serial data transmission, a group of bits of data flow in sequential order through single communication line. The flow of traffic on one lane residential street is an example of serial data transmission mode.

Q24: What is Synchronous Transmission?

Ans: In synchronous transmission, data is transmitted block by-block or word at the same time. Each block may contain several bytes of data. In this mode, data is saved before sending. A large volume of data can be transmitted at a time. The data transmission is very fast. It is most commonly used by remote communication systems.

Q25: What is Asynchronous Transmission?

Ans: In asynchronous transmission, data is transmitted one byte at a time. The data is transmitted character-by- character as the user types it on a key board. In this mode, data is not saved before sending.

Q26: What is Bandwidth?

Ans: The amount of data that can be transmitted through the transmission media within the given period of time is called bandwidth.

Q27: What is Baseband?

Ans: Baseband is a communication technique in which digital signals are directly transmitted over transmission line without changing into analog signals (i.e. without using modulation technique. In this communication technique, there is no need to use any complex modem. The digital signals are commonly called baseband signals.

Q28: What is Broadband?

Ans: Broadband is another communication technique in which large amount of data (such as voice and video) is transmitted over long distance at the same time. The data is sent by modulation each signal onto different frequency. For this purpose, FDM (Frequency Division Multiplexing) technique is used, which multiple signals can be transmitted at the same time.

Q29: What is communication Media?

Ans A path through which data is transmitted from one place to another is known as communication media. It is also known as a communication channel. Following are examples of communication media:

1. Twisted pair wires
2. Coaxial cable
3. Fiber optic
4. Microwave
5. Satellite

Q30: What is Guided Media?

Ans: In guided communication media, communication devices are directly linked with each other via cables or physical media for transmission of data. The data signals are bounded to a cabling media. Therefore, guided media is also called bounded media.

Q31: What is Unguided Media?

Ans: In unguided communication media, data is communicated between communication devices in the form of waves. Unguided media provides means to transmit data signals but does not guide them along a specific path. The data signals are not bounded to a cabling media. Therefore, unguided media is also called unbounded media.

Q32: What is Twisted Pair?

Ans: Twisted pair cable is one of the most commonly used communication media. It is used in local area network (LAN) for data communication between different computers. It is also used in telephone lines to carry voice and data signals.

Q33: What is Coaxial Cable?

Ans: Coaxial cable is also referred to as Coax. It carries signals of higher frequency ranges than twisted pair cable. Coaxial cable consists of a single solid copper wire, which is called the inner conductor. The bandwidth of coaxial cable is 80 times greater than twisted pair media. Coaxial cable is also widely used in local area network (LAN).

Q34: What is Fiber Optic Cable?

Ans: In twisted pair cable and coaxial cable, data is transmitted in the form of electric frequencies. The fiber optic cable uses light to transmit data. The data transmission speed is very high (because fiber optic cable uses light to transmit data). The data transmission speed is up to billions bits per second. Today, most of the telephone companies and cable TV operators are using fiber optic cables in their networks.

Q35: What is Microwave transmission?

Ans: In microwave transmission, data is transmitted through air or space unlike cables or wires. Microwaves are high frequency radio waves. These waves can only travel in straight lines.

Q36: What is Communication Satellite?

Ans: A communication satellite is a space station. It receives microwave signals (or messages) from earth stations. It amplifies the signals and retransmits them back to earth. It is established in space about 22,300 miles above the earth.

Q37: What is mobile communication?

Ans: Mobile communication is a radio-based network that transmits data to and from mobile computers. The data is communicated through radio signals from one location to another. The computers can be connected to the network through wireless connections or through wires.

Q38: What is a Modem?

Ans: Modem stands for modulator/demodulator. It is an electronic device that converts digital signals into analog signals and vice versa. Modems are used on both ends of the computers for data communication between computers through telephone line.

Q39: What is modulation and demodulation?

Ans: This process to convert digital signals into analog signal is called modulation. Similarly, to receive the data from another computer through telephone line, in the form of analog signals, it must be converted into digital form to store it into the computer. This process of converting the analog signals into digital form is called demodulation.

Q40: What do you know about Wireless Modem?

Ans: Wireless modem transmits the data signals through air instead of using a cable. Wireless modem is called radio frequency modem. This type of modem is designed to work with cellular technology, and wireless local area networks.

Q41: Explain external modem.

Ans: 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 COMI or COM2 port. It requires external power supply. It is easy to setup.

Q42: Explain internal modem.

Ans: 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 modems.

Q43: Define two characteristics of analog signals?

Ans: The basic two characteristics are analog signals are: Frequently:

Frequently: The number of times a wave repeats during a specific time interval is called a frequency it is measured in Hertz (Hz).

Amplitude: the height of a wave within a given period of time is called amplitude.