

Q1. Select the correct answer of the given ones.

- 1) The interactive transmission of data within a time sharing system may be best suited to
(a) simplex lines **(b) half-duplex lines** (c) full-duplex lines (d) biflex lines
- 2) The loss in the signal power as light travels down the fibre is called
(a) attenuation (b) propagation (c) scattering (d) interruption
- 3) According to Shannon, if the bandwidth of a signal is 19 MHz then the maximum data transfer speed in it is restricted to _____.
(a) odd **(b) even** (c) a and b both (d) 38 Mbps
- 4) Additional signal introduced in the desired signal is called
(a) equal resistance (b) noise
(c) a and b both **(d) attenuation**
- 5) The slowest transmission speeds are those of
(a) twisted –pair cable (b) coaxial cable (c) fibre –optics (d) microwaves
- 6) The frequency range of 300kHz to 3 MHz is used for
(a) **AM radio transmission** (b) FM radio transmission
(c) TV transmission (d) Microwave Communication.
- 7) Transferring information between an Apple II and an IBM PC
(a) cannot be done (b) can be done over telephone line (c) both b and c
(d) enables you to run programs written for an Apple on an IBM PC .
- 8) Devices interconnected by LAN should include
(a) **Computers and terminals** (b) mass storage devices (c) Hubs (d) gateways
- 9) A network which is used for sharing data, software and hardware among several users owning microcomputers is called a. WAN b. MAN **c. LAN** d. VAN
- 10) An example of analog communication method is
a. laser beam b. microwave c. voice grade telephone line **d. all of these**

Q2: Distinguish between circuit switching, packet switching and modulation.

Circuit switching:

In circuit switching there are 3 phases:

1. Connection Establishment
2. Data Transfer.
3. Connection Released.

In circuit switching, each data unit know the entire path address which is provided by the source.

In Circuit switching, data is processed at source system only

Delay between data units in circuit switching is uniform.

Resource reservation is the feature of circuit switching because path is fixed for data transmission.

Packet switching

In Packet switching directly data transfer takes place .

In Packet switching, each data unit just know the final destination address intermediate path is decided by the routers.

In Packet switching, data is processed at all intermediate node including source system.

Delay between data units in packet switching is not uniform.

There is no resource reservation because bandwidth is shared among users.

Modulation

Modulation is the process of converting data into radio waves by adding information to an electronic or optical carrier signal. A carrier signal is one with a steady waveform -- constant height, or amplitude, and frequency. Information can be added to the carrier by varying its amplitude, frequency, phase, polarization for optical signals and even quantum-level phenomena like spin.

Types of modulation:

Amplitude modulation

a type of modulation where the amplitude of the carrier signal is modulated (changed) in proportion to the message signal while the frequency and phase are kept constant.

Frequency modulation

a type of modulation where the frequency of the carrier signal is modulated (changed) in proportion to the message signal while the amplitude and phase are kept constant.

Phase modulation

a type of modulation where the phase of the carrier signal is varied accordance to the low frequency of the message signal is known as phase modulation.

Q3: What is media? Write down different types of media. Explain characteristics and structure of only wired transmission media?

What is media

Media refers to the communication channels used to interconnect nodes on a computer network. Typical examples of network media include copper coaxial cable, copper twisted pair cables and optical fiber cables used in wired networks, and radio waves used in wireless data communications networks.

Different types

There are many different types of transmission media, the most popular being twisted-pair wire(normal electrical wire), coaxial cable (the type of cable used for cable television), and optic cable (cables made out of glass)

Characteristics and structure of wired transmission media

Guided Media (Wired Media):

It is also referred to as Wired or Bounded transmission media. Signals being transmitted are directed and confined in a narrow pathway by using physical links.

Features

- High Speed
- Secure
- Used for comparatively shorter distances

There are 3 major types of Guided Media:

(i) Twisted Pair Cable

It consists of 2 separately insulated conductor wires wound about each other. Generally, several such pairs are bundled together in a protective sheath.

(ii) Coaxial Cable

It has an outer plastic covering containing 2 parallel conductors each having a separate insulated protection cover. Coaxial cable transmits information in two modes: Baseband mode(dedicated cable bandwidth) and Broadband mode(cable bandwidth is split into separate ranges). Cable TVs and analog television networks widely use Coaxial cables.

(iii) Optical Fiber Cable

It uses the concept of reflection of light through a core made up of glass or plastic. The core is surrounded by a less dense glass or plastic covering called the cladding. It is used for transmission of large volumes of data.

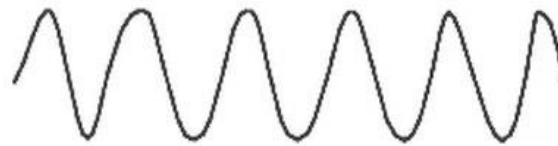
The cable can be unidirectional or bidirectional. The WDM (Wavelength Division Multiplexer) supports two modes, namely unidirectional and bidirectional mode.

Q4: Compare analog and digital transmission. Which one is better in your opinion and why?

Analog Transmission

An analogue signal (otherwise known as a wave form) is characterized by being continuously variable along both amplitude and frequency. In the case of telephony, when we speak into a handset, our voice is converted into current or voltage fluctuations. Those fluctuations in current are an analogue transmission of the actual voice pattern.

To transmit an analogue signal effectively, we need to define the frequency in which it operates. In telephony, the usable voice frequency band ranges from approximately 300 Hz to 3400 Hz, and so the network provider (Phone Company) will allocate a bandwidth of around 4,000Hz for voice transmission.



Analog Signal

Digital Transmission

Digital signals are much simpler than analogue signals. Instead of a continuous wave form, analogue signals are made up of a series of pulses that represent either one bit or zero bits. Each computer system uses a coding scheme which defines what combinations of ones and zeros make up all the characters in the character set.

The data (ones and zeros) are carried throughout the network depending on whether it is an electrical or optical transmission system.



Digital Signal

Digital Transmission is better than analog transmission

- It Discrete signal, and represented as either changes in voltage or changes in light levels.
- Bits per second (for example, a T-1 line carries 1.544Mbps, and an E-1 line transports 2.048Mbps).
- High bandwidth that can support high-speed data and emerging applications that involve video and multimedia.
- High; multiplexers enable multiple conversations to share a communications channel and hence to achieve greater transmission efficiencies.
- Low because only two discrete signals—the one and the zero—need to be transmitted.
- Good; encryption can be used.

Q5. Explain TCP/IP layered architecture with diagram and its functionality.

TCP/IP

TCP/IP Model helps you to determine how a specific computer should be connected to the internet and how data should be transmitted between them. It helps you to create a virtual network when multiple computer networks are connected together. The purpose of TCP/IP model is to allow communication over large distances.

TCP/IP stands for Transmission Control Protocol/ Internet Protocol. It is specifically designed as a model to offer highly reliable and end-to-end byte stream over an unreliable internetwork.

1. Process/Application Layer
2. Host-to-Host/Transport Layer
3. Internet Layer
4. Network Access/Link Layer

DIAGRAM and its functionality

