

1.

a) What is meant by data communication and explain its characteristics? — 6

b) Application of communication and computer network ³

c) Explain different type of network ² - 5

2.

a. How does the internet work ²⁺³

b.) Difference between VLAN and INTER-VLAN ²⁻⁴

c) What is the router protocol and routing protocol? what is OSI and its main purpose? - 7

3.

a) How many types of Topology? And discuss

Ring topology. \rightarrow 5

b) Advantage and disadvantage of Hybrid topology. \rightarrow 4

c) What is OSI model? And describe this layers? \rightarrow 5

4. a) Discuss Internet model layers with example³

b) Define protocol: Explain the difference between symmetric and asymmetric encryption. → 5

c) Which is the better security measure HTTPS or SSL? Define the salting process and what it's used for. — 6

5. a) What are the features provided by layering.

b) And compare datagram networks and virtual circuit network. — 7

c) List three techniques of digital to digital conversion — 3

d) Distinguish between a signal element and data element. — 4

Q. (a) what are the types of transmission media with example.

(b) what is transmission media? Mention the most

commonly used transmission media in home?

c) List techniques of digital to analog conversion?

2.

a) Differences between wireless Adhoc network and wireless Sensor network - 4

b) Advantage and disadvantage of wireless communication. Generation of wireless communication. - 6

e) what is the wireless application protocol and wireless sensor network - 4

8. a) what is the Multiplexing and demultiplexing in Transport layer? - 5

b) what is the dense wavelength division multiplexing - 3

c) describe frequency division and time division multiplexing - 6

1.

a) what is data communication? And characteristic of data communication.

b) Application of communication and net work?

c) Explain difference type of network?

1 Answer (a)

What is data communication?

Data communication means the exchange of data between two devices via some form of transmission medium such as a wire cable.

Characteristics of data communication:

1. Delivery: The system must deliver data to the correct destination. Data must be received by the intended device or user and only by that device or user.
2. Accuracy: The system must deliver the data accurately. Data that have been altered in transmission and left uncorrected and unusable.
3. Timeliness: The system must deliver data in time

manner. Data delivered late and useless. In the case of video and audio, timely delivering data as they are produced.

4. Jitter: Jitter refers to the variation in the packet arrival time. If it is the uneven delay in the delivery of audio or video packet, if some of the packet arrive with 30 ms delay, an uneven quality in the video is the result.

1 Answer (b)

Application of communication and computer networks.
computer system and peripherals are connected
to the form a network.

1. Resources sharing such as printers and storage devices.
2. Exchange of information by means of e-mails and FTP.
3. Information sharing by using web or internet.
4. Interaction with other users dynamic web page.
5. IP phone.
6. Video conferences.
7. parallel computing.
8. Instant messaging.

1 Answer (c)

Type of network.

1. Local area network:

A local area network (LAN) is usually privately owned and links the devices in a single office, building or campus. Depending on the needs of an organization and the types of technology used a LAN can be simple as two PCs and printer someone home office, or it can extend throughout a company and include audio and video peripheral.

2. personal Area network :

A personal area network (PAN) is smallest network which is very personal to a user.

This may include a bluetooth enable device or infra-red enable device. PAN has connectivity range up to 10 metre. PAN may include wireless computer network keyboard and mouse. Bluetooth enable headphone, wireless and TV remotes.

3. Metropolitan Area Network:

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 distribution network Data Internece.

Metro ethernet is a service which is provided by ISPs. This provided by ISPs. This service enable its users to expand their local network.

4. Wide area network:

As the suggests the wide area network (WAN)

covers a wide area which may span across

provinces and even whole country. Generally

telecommunication network are wide area

network. They provide connectivity to MANs

to LANs. Since they are equipped with very
high speed backbone.

2 Answer (a)

A network of networks is called an inter-network, or simple the internet. It is largest network in existence on this planet. The internet hugely connects all WANs and it can have connection to LAN and home network. Internet uses TCP protocol suite and user IP as its address protocol. Present day, Internet widely implemented using IPv4. Because of shortage of address space Internet enable its users to share and access enormous amount of information world wide. It uses W.W.W, FTP, email service, audio, and video streaming etc. At huge level, internet work on client-service model.

Ans. to the question no - 2 (b)

A VLAN is a logical group of network users and resources which are connected to administratively defined ports on a switch.

The break up broadcast domains of VLAN in layer 2 switch network. Virtual LANs divide single physical layer network into multiple broadcast domains.

Whereas VLAN-enabled switch cannot by themselves, forward traffic across VLAN boundaries. So we need to route between these VLANs which is named as inter-VLAN routing. We can achieve this by using either a layer 3 switch or by a router.

Ans. to the question no - 2(c)

Routing protocol: A routing protocol is usually used by routers for finding dynamically all the networks in the inter-network and to make sure that all routers have same routing table.

Usually routing protocol determine that the path of a packet by an inter-network. A router protocol is used to send user data through the enterprise which is established when routers come to know about all networks. Router protocol are assigned to an interface and decides the packet delivery method.

OSI and its purpose: OSI reference model includes seven layers which helps the data to move

in more optional from source to the reaching point. And hence the hide of protocol are better so the further enhancement are done easily. This reference model are used for both connection-oriented and connection-less service.

3.

a) How many types of topology? And discuss Ring topology? - 5

b) Advantage and disadvantage Hybrid topology
- 9y - 4

c) what is OSI model? And describe this layer. - 5

Ans. to the question. no - 03 (a)

Type of network Topology: The arrangement of a network which comprise of nodes and connecting lines via sender and receiver is referred as network topology. The various topologies are:

- i) Mesh topology.
- ii) Star topology.
- iii) Bus topology.
- iv) Ring topology.
- v) Tree topology.
- vi) Hybrid Topology.
- vii) point-to-point topology.

Ring Topology: In ring topology, each host machine, creating a circular network structure. When one host tries to communicate or send message to a host which is not adjacent to it the data travel through all intermediate hosts. To connect one more host in the existing structure, the administrator may need only one more extra cable.

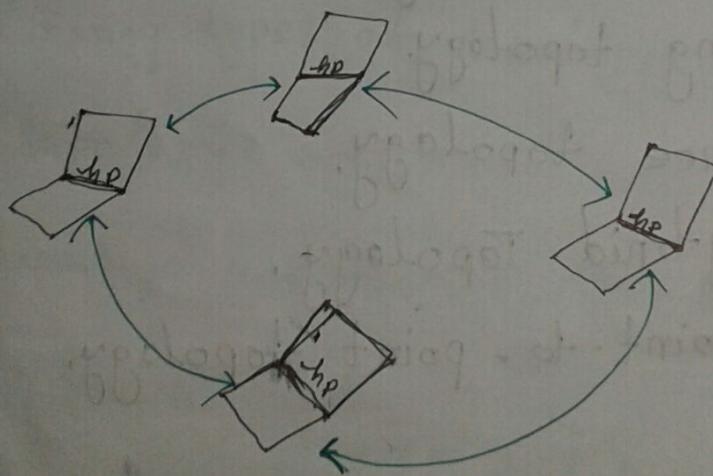


fig: ring topology.

Every connection in the figure ring is a point-to-point connection.

Ans. to the question no-3 (b)

A combination of two or more topology is known as hybrid topology.

Advantage of Hybrid topology:

1. we can choose the topology based on the requirement for example, scalability is our concern then, we can use star topology instead of bus technology.
2. Scalable as we can further connect other computer network with the existing network with different topology.

Disadvantage of Hybrid topology:

1. Fault detection is difficult.
2. Installation is difficult.
3. Design is complex so maintenance is high

1

Ans. to the question no — 3 (c)

OSI model: Open system Interconnect is an open standard for all communication systems. OSI model is established by International established standard organization. This model has seven-layer.

OSI model layer:

1. Application layer.
2. presentation layer.
3. Session layer.
4. Transport layer.
5. network layer.
6. Data link layer.
7. physical layer.

4. (a) Discuss internate model layer with example?

(b) Define protocol. Explain the difference between symmetric and asymmetric Encryption.

(c) Which is the better security measure HTTPS or SST? Define the salting process and what it's used for?

Ans. to the question no - 4 - (a)

Internet uses TCP/IP protocol suite, also known as Internet suite. This define Internet model which contain four layered architecture. The model has following layer.

1. Application layer: This layer define the protocol which enable user to interact with the network. Example: FTP, HTTP

2. Transport layer: This layer define how data should flow between host. major protocol at this layer is transmission control protocol.

3. Internet layer: Internet protocol work on this layer. This layer facilitate host addressing and recognize. This layer define routing.

4. Link layer: This layer provides mechanism of sending and receiving actual data. Unlike

Ans. to the question no - 4 (b)

Protocol: In networking, a protocol is a set of rules for information formatting and processing data. Network protocol like a common language for computer.

Symmetric and asymmetric encryption:

Long story short, symmetric encryption uses the same key for both encryption and decryption, whereas, asymmetric encryption employs different keys for the two processes. Symmetric is faster for obvious reasons but requires sending the key through an unencrypted channel, which is risk.

Answer to the question - 4 (c)

HTTPS (HyperText Transfer protocol) ~~Secure~~

is HTTP combined with SSL, encrypting

a user's browsing activity and making
it safer. SS (Secure Sockets Layer) is

a protocol that protects internet com-
munication between two or more parties

through its close, SSL wins out in terms

of sheer security. Through any of these

are valuable things to know for

the purpose of web development.

Salting process:

Salting process where in you add special characters to a password in order to make it stronger. This increases password strength in two ways. It makes longer and it adds another set of characters that hacker would have to guess from. It's good measure to take as for user who tend to habitually make weak password. But overall it's a low-level defense since more experienced hackers are already familiar with the process and take it into account.

5.

a) what are the features provided by layering?

And compare datagram networks and virtual circuit network?

b) list three network techniques of digital to digital conversion?

c) distinguish between a signal element and data element?

Ans. to the question no-5 (a)

Two nice feature are:

1. It decomposes the problem of building

network into more manageable component.

1. It provides a more modular design.

virtual circuit	Datagram circuit.
A virtual network is a cross between a circuit-switched network and a datagram network.	In a datagram network each packet is independently of all others. Even if a packet is part of the multipacket transmission, the network treats it as though it existed alone.
The data link layer of the technologies is well suited to the virtual-circuit technology.	Datagram switching is normally done at the network layer.

Ans. to the question no - 3(b)

The three different technique are line coding, block coding, and scrambling.

Line coding: Line coding is a process of converting digital data to digital signals. we assume that, data in the form of text, graphical image are stored in computer memory.

block coding: We need redundancy to ensure synchronization and to provide some kind of inherent error detecting. Block coding can give us this redundancy and improves the performance of the line coding.

Ans. to the question no-5(c)

signal element	Data element
1. A signal element is the shortest unit of a digital signal.	1. A data element is the smallest entity that can represent a piece of information.
2. signal element are what we can send	2. Data element are what we need to send
3. Signal element are the carriers	3. Data element are being carried.

6. (a) what are the types of transmission media with example. - 8

b) what is transmission media? Mention the most commonly used transmission media in home. - 6

c) List techniques of digital to analog conversion. - 2

Ans. to the question no- 6 (a)

There are two types of transmission media are guided and unguided.

Guided media: This kind of transmission

media is also known as wired. otherwise bounded media. In this type signal can be transmitted directly and restricted in a thin path through physical links.

This kind of media is classified into three types.

1. Twisted pair cable
2. Shielded twisted pair (STP)
3. Coaxial cable
4. Optical fiber cable

unguided media:

It is also known as unbounded otherwise wireless transmission media. It doesn't need any physical medium to transmit electro

magnetic signal. These waves are classified into two types

1. Micro waves.

2. Infrared waves.

Ans. to the question no - 6 (b)

A communication channel that is used to carry the data from the transmitter to the receiver through the electromagnetic signal.

The main function of this carry

the data in the bits. From the

the local Area Network.

Mention the most commonly used transmission media in home.

They are coaxial cable, twisted-pair, satellite, fiber optics and micro wave.

Coaxial cable: This cable contain an ~~thick~~ external plastic cover and it conductors where each conductor include separate conductor cover.

Optical fibre cable:

This cable use the though of light reflected through a cone made that is made with plastic glass.

Ans. to the question no-6 (c)

When data one computer sent to another via some analog carrier it is first converted into analog signal. Analog signals are modified to reflect digital data. An analog signal is characterized by its amplitude, frequency and phase. There are three kinds of analog to digital conversion.

1. Amplitude shifting keying:

In this converting technique, the amplitude of analog carrier signal is modified to reflect binary data.

When binary data represents digit 1.

Frequency shift keying: In this conversion technique the frequency of the analogue signal carrier signal is modified to the reflect binary data.

Phase shifting keying: In this conversion scheme, the phase of the original carrier signal is altered to reflect the binary data.

Quadrature phase shift keying: QPSK alters the phase to reflect two binary digit at once. This is done in two difference phase. The main stream of binary data is divide equally into two sub-stream. The

7. (a) Differences between wireless Ad-hoc network and wireless sensor network

(b) Advantage and disadvantage of wireless communication. Generation of wireless communication.

(c) what is the wireless application protocol and wireless sensor network - 4.

Answer to the question no-7 (a)

wireless Adhoc network: A wireless ad-hoc network is a wireless mesh network, mobile-ad-hoc network, and vehicular

network. Its history could be traced back to the defense advanced Research project Agency and packet Radio network.

which evolved into the survival adaptive radio network.

wireless Sensor network: A wireless Sensor Network can be characterize as a system of devices, indicated as nodes which can detect the environment and impart the data accumulated from the monitored field through remote or wireless connection. It can be depicted as a system of nodes that agreeably sense and may control the environment enable association between people or computer

Ans. to the question no. 7 (b)

Advantage:

1. Freedom from wires.
Can be configured with the use of
any physical connection.
2. Easy to setup
3. Better on global coverage.
4. flexibility.
5. cost - effectiveness.

Disadvantage:

1. communication is done through open
space, it is less secure.
2. unreliability.
3. Increased chance of Jamming.

Generation of wireless communication:

We have very huge improvement in wireless communication and have expanded the capabilities of our wireless communication system. There are various generations.

1. 1st Generation.

2. 2nd Generation

3. 3rd Generation.

4. 4th Generation.

5. 5th Generation.

Ans. to the question 7-(c)

WAP stands for wireless application protocol. It is protocol design for micro-browsers and it enable the access of internet in the mobile devices. It uses the mark-up language WML. WML define as XML 1.0 application. It enable creating web application for mobile devices. WAP protocol was resulted by the Joint effort of the various member of WAP forum.

Wireless sensor network: wireless sensor network is an infrastructure-less wireless network that is.

deployed in a large number of wireless sensor in an ad-hoc manner that is used to monitor the system.

- Q. what is the multiplexing and demultiplexing in transport layer. - 5
- b) what is the dense wavelength division multiplexing → 3
- c) Describe frequency division and time division multiplexing. - 6

Ans. to the question no- 8 (a)

Multiplexing: Gathering data from multiple application process of sender enveloping that data with header and sending them as a whole to the intended receiver is called as multiplexing.

Demultiplexing: Delivering received segments receiver side to the connect app layer processed is called as demultiplexing.

Multiplexing and demultiplexing are the service facilitated by the transport layer of OSI model.

Ans. to the question no - 8

Dense wavelength division multiplexing or DWDM is the method which allows multiple wavelength to be single-mode fiber, consequently growing the potential of that particular transmission route by using a factor which is equal to the total number of wavelength that one has added during transmission. It is very challenging as the telecommunication canals have to fulfill all the requirement with the given constraints which result in an increase in network capacity.

Component of DWDM:

1. DWDM multiplexer.

2. Optical add/drop multiplexer.
3. OXC
4. optical amplification
5. Re-generation.
6. Optical amplifier.

Ans. to the question - 8-(c)

Frequency division multiplexing:

In this number of signals in the allotted frequency range. There is a suitable frequency gap between the 2 adjacent signals to avoid over-lapping. Since the signals are transmitted in allotted time

so this decrease the probability of collision. The frequency spectrum is divided into several logical channels, in which.

Time division multiplexing:

This happens when data transmission rate of media is greater than that of all source and each signal is allotted a definite amount of time. These slot slots are so small that all transmission appear to be parallel. In frequency division multiplexing all the signals operate at the same time difference frequencies but in the time division multiplexing all the signals operate with same time