ECE - 416

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1) Explain Various unguided media with examples:

A) Unguided Media :-

The unguided media is likewise called wireless communication. It doesn't need any physical medium to transmit electromagnetic signals. In unguided medium the electromagnetic signals are broadcasted through the air to everybody. These signals are accessible to one who has the gadget equipped for receiving those signals.

The unguided media is additionally called unbounded media as its doesn't have any line constraint The unguided media allows the user to associate constantly as the correspondance is wireless the user can interface himself from to the network.

The unguided media is classified into 3 types

1. Radio Waves
2. Micro Waves
3. Infrared Waves.

→ Radio Waves

The radio waves are created effectively. They are low recurrence signals and can travel a significant distance. The radio waves can penetrate through the structures. the wave length of radio waves ranges from thousands as low as 3Hz and as high as 1 gigaherty (10^9 Hz). They are used in standard broadcast ratio and television, short wave radio, navigation and air traffic control, cellular telephony and even remote controlled toys.

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→ Micro waves:-

The microwaves are transmitted in a straight line and consequenly require line-of-sight transmission the distance covered by the microwave signal relies upon the stature of the two radio wire more the taller are reception apparatuses longer is the distance covered by the sign the microwave is used for phone correspondance cell phones. TV distribution and so on

→ Infrared waves:-

The infrared waves are used for short-ranges correspondance like, the remote control for TVs, VCRs, and so forth uses infrared waves. It cannot infiltrate through abstructions. A government license isn't needed to work an infrared frame work as it is safer against eaves dropping.

2) Define Topology and also justify the statement "If like central controller fails it hampers the entire network"

A:- Topology:-

Network topology is the arrangement of the element of a communication network. Network topology can be used to define or describe the arrangement of various types of telecommunication industrial fieldbuses and computer Networks

Examples of network topologies are found in local area networks (LAN). A common computer network installation. Any give node in the LAN has one or more physical links to other devices in the Network; graphically mapping these links results in a geometric shape that can be used.

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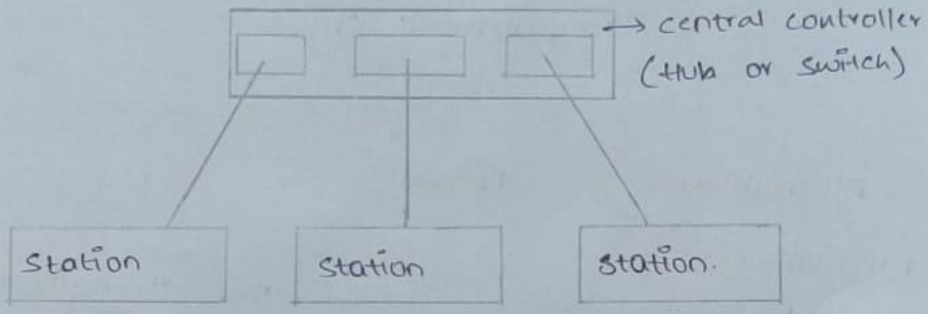
to describe the physical topology of the network. A wide variety of physical topology have been used in LANs, including ring, bus, mesh star and hybrid.

* Statement:-

"If the central controller fails it hampers the entire network".

⇒ It occurs in the star topology.



Yes, the given statement is true, Because all the stations are connected to the central controller. If the central controller fails then all the stations are also fails this the dis advantage of the star topology.

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(3) Explain how the different transmission impairments effects the communication.

-Ans- In communication system, analog signals travel through transmission media, which tends to deteriorate the quality of analog signal, which means that the signal at the beginning of the medium is not have same as the signal at the end of the medium. the imperfection causes signal impairment. Below are the causes of the impairments

Impairment causes.

- Attenuation
- Distortion
- Noise.

→ Attenuation

It means loss of energy. The strength of signal decreases with increasing distances which causes loss of energy in over coming resistance of medium. This is also known as attenuated signal. Amplifiers are used to amplify the attenuated signal which gives the original signal back and compensate for this loss.

→ Distortion :-

It means changes in the form of shape of the signal this is generally seen in composite signals made up with different frequency. each frequency component has its own Nopogation speed travelling through a medium and that why it delay in arriving at the finial destination every component arrive at different time which leads to distortion. therefore they have different phase at receiving end from what they had at senders end.

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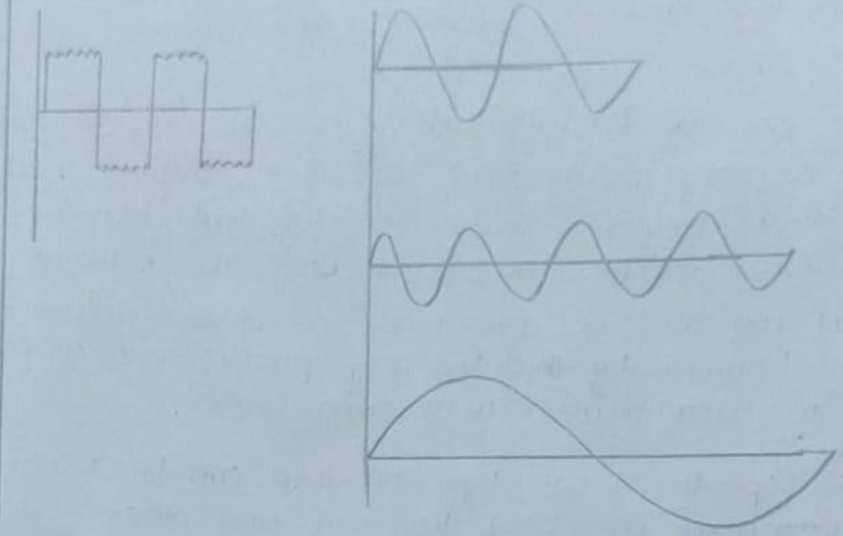

→ Noise:- The random or wanted signal that mixes up with the signal is called as noise There all several types of noise such as induced noise such as induced noise, cross talk noise, thermal noise and impulse noise which may corrupt the signal.

Induced noise comes from sources such as motols and appliance. these derices act as sending antena and tranmission medium act as reciving antenna. Thermal noise is movement of elections in wire which creates an extra signal cross talk noise is when one wire affects the other wire impulse noise is a signal with high energy that comes from.

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Q4) Define Motocol and its various key elements.

A) Protocols:-

Protocols are a fundamental aspect of digital comm
- unication as they dictate how to format, transmit and receive data. they are a set of rules that determines how the data will be transmitted over the network.

It can also be defined as a communication standard followed by the two key parties in a computer network to communication with each other.

It specifies what type of data can be transmitted what commands are used to send and receive data and how data transfer are confirmed

In simple terms, a Motocol is similar to a language every language has its own rules and vocabulary protocols have their own rules, specification, and implem
- entation. If two people share the same language they can communicate very easily and effectively. similarly two hosts implementing the same protocol can connect and communicate easily with each other. Hence protocols provide a common language for Network devices participating in data communication

⇒ Types of protocols:-

protocols can be broadly divided into the following two types

1) standard protocols 2) proprietory protocols.

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* Key elements of protocols:

There are mainly 3 key elements of a protocols, they are

1) Syntax
2) Semantics
3) Timing.

1) Sytax:-

Syntax refer to the structure or format of data and signal levels It indicates how to read the data in the form of bits or fields it also decides the order in which the data is presented to the receiver.

* Example:- A protocol might expect that the size of a data packet will be 16 bits In which the first 4 bits are sender's address the next 4 bits are the receiver's address, the next 4 bits are the cheak sum bits and last 4-bits will contain the message, so every communic - ation that is following that protocol should send 16-bit data

2) Semantics

It Refers to the interpretation or meaning of each section of bits or fields. It specifier which field defines what action. It defines how a particular section of bits or pattern can be interpreted, and what action needs to be taken.

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Examples

It interprets whether the bits of address identify the route to be taken or the final destination of the message or something else.

* Timing:-

It refers to two characteristics.

1. when the data should be sent
2. what will be the speed of sending and receiving the data?

It perform speed matching, sequencing and flow control of the data items

Example:-

A sender can send the data at a speed of 100 Mbps, but the recivers can consume it only at a speed of 20Mbps then there may be data losses or the packet might get dropped, so, props synchronization must be there between a sender and reciver.

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5) Why the OST is called reference model? Explain the forms IGMP, ARP and ICMP with example.

A) OST (Open systems Interconnection) :- Is a reference model for how applications communicate over a network.

- A reference model in a conceptual frame work for understanding relation ships the purpose of OST reference model is to guide vendors and developers so the digital communication products and software programs they create can interoperate and to facilate a clear flamework that describes the function of a netwking of telecommunication system.

IGMP:-

The Internet group mangement protocol is used by IPVt system to forward their multicast group membership to multi routers All hosts that want to receive IP multcast must have implemented this protocol

ARP:-

The Address Resolution protocal is used to determine correlation between IP and MAC address. If an IP code wants to address a particular destination but does not know its MAC address it can be requested using ARP. The send node broad cast on ARP request to the network for this After the response in received the contained MAC address can then be saved in ARP cache and forworded.

ICMP:-

The Interent control message protocol is part of every IP implementation and is used there for control tasks. A typical applicatio example is icmp echo Request (PING). IP communication between two computers can be cheaked using this command. This is done by sending an icmp echo Request to a desired node of this node answer with an PONG, requesting node knows that the dressed node is available

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6) A non-periodic composite signal contains frequency from 10 to 30 KHz. The peak amplitude is 10V for the lowest and the highest signal and is 30V for the 30KHz signal. Assuming that the amplitude change gradually from the minimum to the maximum, draw the frequency spectrum

A:- The frequency spectrum is as follows:-