SHREE DATTA POLYTECHNIC COLLEGE,

DATTANAGAR SHIROL

Class Test-01

Course Code: CO4G   **Time :02:00pm TO.03:00pm**

Subject:-CNE (Computer Network)   **Subject code:-17429**

Marks:-25   **Date:-23/01/2014.**

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Q.1) Attempt any THREE of the following.   **(3*3=09)**   **09M**

1. Define Computer Network ?Advantages & Disadvantages of Computer Network.

Ans:- A network consists of two or more computers that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.

Advantages

User access control.
>   Modern networks almost always have one or more servers which allows centralized management for users and for network resources to which they have access. User credentials on a privately-owned and operated network may be as simple as a user name and password, but with ever-increasing attention to computing security issues, these servers are critical to ensuring that sensitive information is only available to authorized users.

Information storing and sharing.
>   Computers allow users to create and manipulate information. Information takes on a life of its own on a network. The network provides both a place to store the information and mechanisms to share that information with other network users.

Connections.
>   Administrators, instructors, and even students and guests can be connected using the campus network.

Services.
>   The school can provide services, such as registration, school directories, course schedules, access to research, and email accounts, and many others. (Remember, network services are generally provided by servers).

Internet.
>   The school can provide network users with access to the internet, via an internet gateway.

Computing resources.
>   The school can provide access to special purpose computing devices which individual users would not normally own. For example, a school network might have high-speed high quality printers strategically located around a campus for instructor or student use.

Course Code: CO4G   **Subject:-CNE** (Computer Network)
Subject code:-17429   **Mr.Chavan S.P.**

Flexible Access.

School networks allow students to access their information from connected devices throughout the school. Students can begin an assignment in their classroom, save part of it on a public access area of the network, then go to the media center after school to finish their work. Students can also work cooperatively through the network.

Workgroup Computing.

Collaborative software allows many users to work on a document or project concurrently. For example, educators located at various schools within a county could simultaneously contribute their ideas about new curriculum standards to the same document, spreadsheets, or website.

Disadvantages

Expensive to Install.

Large campus networks can carry hefty price tags. Cabling, network cards, routers, bridges, firewalls, wireless access points, and software can get expensive, and the installation would certainly require the services of technicians. But, with the ease of setup of home networks, a simple network with internet access can be setup for a small campus in an afternoon.

Requires Administrative Time.

Proper maintenance of a network requires considerable time and expertise. Many schools have installed a network, only to find that they did not budget for the necessary administrative support.

Servers Fail.

Although a network server is no more susceptible to failure than any other computer, when the files server "goes down" the entire network may come to a halt. Good network design practices say that critical network services (provided by servers) should be redundant on the network whenever possible.

Cables May Break.

The Topology chapter presents information about the various configurations of cables. Some of the configurations are designed to minimize the inconvenience of a broken cable; with other configurations, one broken cable can stop the entire network.

Security and compliance.

Network security is expensive. It is also very important. A school network would possibly be subject to more stringent security requirements than a similarly-sized corporate network, because of its likelihood of storing personal and confidential information of network users, the danger of which can be compounded if any network users are minors. A great deal of attention must be paid to network services to ensure all network content is appropriate for the network community it serves.

2. Define Network Topology and types of Network Topology.

Ans:- In communication networks, a topology is a usually schematic description of the arrangement of a network, including its nodes and connecting lines. There are two ways of defining network geometry: the physical topology and the logical (or signal) topology.

The physical topology of a network is the actual geometric layout of workstations. There are several common physical topologies, as described below and as shown in the illustration.

Bus

Star

Token ring

Ring

Mesh

Tree
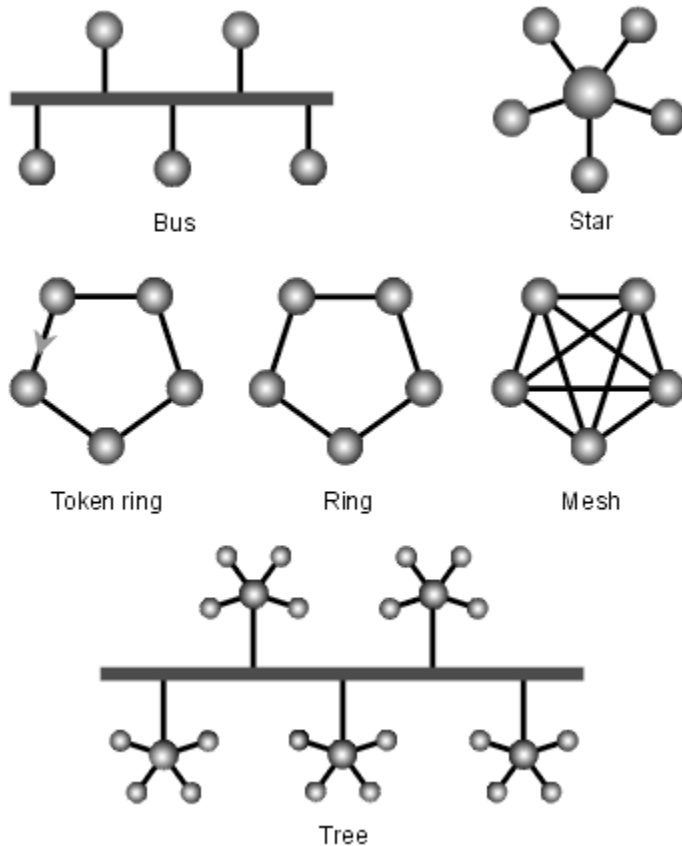
In the bus network topology, every workstation is connected to a main cable called the bus. Therefore, in effect, each workstation is directly connected to every other workstation in the network.

In the star network topology, there is a central computer or server to which all the workstations are directly connected. Every workstation is indirectly connected to every other through the central computer.

In the ring network topology, the workstations are connected in a closed loop configuration. Adjacent pairs of workstations are directly connected. Other pairs of workstations are indirectly connected, the data passing through one or more intermediate nodes.

If a Token Ring protocol is used in a star or ring topology, the signal travels in only one direction, carried by a so-called token from node to node.

The mesh network topology employs either of two schemes, called full mesh and partial mesh. In the full mesh topology, each workstation is connected directly to each of the others. In the partial mesh topology, some workstations are connected to all the others, and some are connected only to those other nodes with which they exchange the most data.

The tree network topology uses two or more star networks connected together. The central computers of the star networks are connected to a main bus. Thus, a tree network is a bus network of star networks.

Logical (or signal) topology refers to the nature of the paths the signals follow from node to node. In many instances, the logical topology is the same as the physical topology. But this is

Course Code: CO4G

not always the case. For example, some networks are physically laid out in a star configuration, but they operate logically as bus or ring networks.

3. Difference between LAN, WAN, MAN .

CRITERIA	LAN	MAN	WAN
Cost	Low	High	Higher
Network Size	Small	Larger	Largest
Speed	Fastest	Slower	Slowest
Transmission media type	Twisted-pair	Twisted-pair and fibre-optic cables	Fiber optic, radio wave and sattelite
Number of computers	Smallest	Large	Largest

4. Explain Network features.

Ans:- User access control.
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it on a public access area of the network, then go to the media center after school to finish their work. Students can also work cooperatively through the network.

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Q.2) Attempt any TWO of the following.   (4*2=08)   08M

1. Difference between Bus and star Topology .

Differentiate between the three types of network topology (3.1.5.2)

Aspect	Bus Topology	Ring Topology	Star Topology
Structure	All computers/nodes are connected to a single central cable (backbone)	All computers/nodes are connected in a loop	All computers/nodes are connected to central host directly
Connection between nodes	It has no connection between nodes but connect to backbone	It has connection between all the nodes	It has no connection between nodes
Ease of trouble shooting	Easy identification of cable faults	Easy to troubleshoot - Repair or remove the failing nodes	Difficult when one of the nodes fails but easy to troubleshoot when the host is fails.
Easy of adding or removing nodes	Easy to implement and extend. New devices can be added to the backbone or to the existing nodes	Difficult because moves, adds and changes of devices can affect the network	Easy to implement and extend. Only add the nodes or devices to the host
Node failure	Failure of a node doesn't affect the entire LAN as long as backbone is working	A failing node will affect the entire LAN	Failure of a node doesn't affect the entire LAN as long as host is working

2. Difference between Peer to Peer and Client Server Network.

Client/Server	Peer-To-Peer
Server has the control ability while clients don't	All computers have equal ability
Higher cabling cost	Cheaper cabling cost
It is used in small and large networks	Normally used in small networks with less than 10 computers
Easy to manage	Hard to manage
Install software only in the server while the clients share the software	Install software to every computer
One powerful computer acting as server	No server is needed

3. Difference between Hub & Switch.

✏ Edit	Hub	Switch
Layer	Physical layer. Hubs are classified as Layer 1 devices per the OSI model.	Data Link Layer. Network switches operate at Layer 2 of the OSI model.
Ports	4/12 ports	Switch is multi port Bridge. 24/48 ports
Transmission Type	Hubs always perform frame flooding; may be unicast, multicast or broadcast	First broadcast; then unicast & multicast as needed.
Table	A network hub cannot learn or store MAC address.	A network switch stores MAC addresses in a lookup table.
Device Type	Passive Device (Without Software)	Active Device (With Software) & Networking device
Transmission Mode	Half duplex	Full duplex
Broadcast Domain	Hub has one Broadcast Domain.	Switch has one broadcast domain [unless VLAN implemented]
Used in (LAN, MAN, WAN)	LAN	LAN
Data Transmission form	Electrical signal or bits	Frame (L2 Switch) Frame & Packet (L3 switch)

Q.3) Attempt any TWO of the following. (4*2=08) 08M

1. Difference between Star and Ring Topology.

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2. Explain PAN & CAN .Enlist Components of Computer Network.

Definition: A *personal area network* - **PAN** - is a computer network organized around an individual person. Personal area networks typically involve a mobile computer, a cell phone and/or a handheld computing device such as a PDA. You can use these networks to transfer files including email and calendar appointments, digital photos and music.

Personal area networks can be constructed with cables or be wireless. USB and FireWiretechnologies often link together a wired PAN, while wireless PANs typically use Bluetooth or sometimes infrared connections. Bluetooth PANs are also sometimes called *piconets*.

Personal area networks generally cover a range of less than 10 meters (about 30 feet). PANs can be viewed as a special type (or subset) of local area network (LAN) that supports one person instead of a group.

A **campus network**, **campus area network**, **corporate area network** or **CAN** is a computer network made up of an interconnection of local area networks(LANs) within a limited geographical area.[1][2] The networking equipments (switches, routers) and transmission media (optical fiber, copper plant, Cat5 cablingetc.) are almost entirely owned by the campus tenant / owner: an enterprise, university, government etc

Components of Computer Network

PC - Basically is a personal computer.

NIC - Network Interface Card - This is both an electrical interface to the router/modem, and a logical board that communicates to the rest of the pc, usually registered jack forty five or registered jack eleven standard. The cable to provide a carrier for the signals is either shielded or unsheilded. When you connect to the internet for example the nic should send out fast link pulses that try to establish the acceptable speed of connection between the modem/router on the global side. These pulses are of a fixed length - if one side can respond within x number of miliseconds it will communicate at y speed, assuming both sides are set to autonegotiate.

NIC has a Media access control or a Burned in address inside one of its microchips - this will NEVER change it can be falsified but it will never actually change - unless you get a new nic.

Hub -Seldom used, this splits the connection between multiple PC's, which may regenerate the signal.

Switch - used to split multiple pcs into different groupings based on logical needs or security needs, within the same subnet or lan

Router - used to send data between physical networks.

3. Draw a neat labeled sketch of a hybrid topology connecting one star network of 4 computers, one ring network of 5 computers and one bus network of 5 computer.?