

Punjab Technical University

B.Tech. – Computer Science & Engineering (Sem. – 4th)

Data Communication

Subject Code: CS-206

2 Marks Questions:-

Q:-1) Define Baud Rate. (May 2012)

Ans:-1) Baud Rate: - The baud rate of a data communications system is the number of symbols per second transferred. A symbol may have more than two states, so it may represent more than one binary bit (a binary bit always represents exactly two states). Therefore the baud rate may not equal the bit rate, especially in the case of recent modems, which can have (for example) up to nine bits per symbol.

Q:-2) What is Terrestrial Microwave? (May 2012)

Ans:-2) A system, method, or service, such as Multichannel Multipoint Distribution Service, which utilizes microwave line of sight communications between sending and receiving units located on the ground or on towers, as opposed to a sender and/or receiver antenna being located on a communications satellite. Used, for instance, for telephone, TV, and/or data services. Also called **Terrestrial Microwave** radio.

Q:-3) What are TLD Servers? (May 2012)

Ans:-3) A **TLD (top-level domain)** is the highest level of domain names in the root zone of the DNS of the Internet. For all domains in lower levels, it is the last part of the domain name, that is, the label that follows the last dot of a fully qualified domain name. In other words the last part of an Internet domain name that follow the final dot of a fully qualified domain name. For example, in the domain name **www.csepedia.com**, the top-level domain is **com**.

Internet Corporation for Assigned Names and Numbers (ICANN) looks after most top-level domain. It operates the Internet Assigned Numbers Authority (IANA) and is responsible for maintaining the DNS root zone. DNS server which keeps all root zone is called **TLD name server**.

Q:-4) What is Hamming Distance? (May 2012)

Ans:-4) In information theory, the **Hamming distance** between two strings of equal length is the number of positions at which the corresponding symbols are different. Put another way, it measures the minimum number of *substitutions* required to change one string into the other, or the number of *errors* that transformed one string into the other.

Examples

The Hamming distance between:

- "toned" and "roses" is 3.

- 1011101 and 1001001 is 2.
- 2173896 and 2233796 is 3.

Q:-5) List two important features of LAN? (May 2012)

Ans:-5) LAN Features

There are some great features of a Local Area Network. Most are used for Business use. Local Area Networks help send, share, and synchronize files all in a short distance for faster connections and download speeds!

Key features:

- Fast connection
- Easy file sharing in a short distance
- Great for synchronizing data over many computers
- Printing from all computers (if you have printer sharing on)

Q:-6) Differentiate between Static and Dynamic Routing Algorithm.

(May 2012)

Ans:-6) In TCP/IP, routing can be one of two types: *static* or *dynamic*.

With Static Routing, you maintain the routing table manually using the **route** command. Static routing is practical for a single network communicating with one or two other networks. However, as your network begins to communicate with more networks, the number of gateways

increases, and so does the amount of time and effort required to maintain the routing table manually.

With Dynamic Routing, daemons update the routing table automatically. Routing daemons continuously receive information broadcast by other routing daemons, and so continuously update the routing table.

Q:-7) What is multiplexing at Transport Layer? (May 2012)

Ans:-7) When the application layer passes large amounts of data to the transport layer. The **transport layer multiplex** different applications communication by dividing the application data into segments and placing a header on each segment to indicate which communication it is associated. Also, because networks can provide multiple routes that can have different transmission times, data can arrive in the wrong order. However by numbering and sequencing the segments, the transport layer can ensure that these segments are reassembled into proper order. Without segmentation, only one application would be able to receive data.

Q:-8) Define Congestion. (May 2012)

Ans:-8) Congestion is a situation in Communication Networks in which too many packets are present in a part of the subnet, performance degrades. In other words when too much traffic is offered, congestion sets in and performance degrades sharply.

Factors causing Congestion:

- The input traffic rate exceeds the capacity of the output lines.
- The routers are too slow to perform bookkeeping tasks (queuing buffers, updating tables, etc.).
- The routers' buffer is too limited.

Q:-9) Define Subnetting. (May 2012)

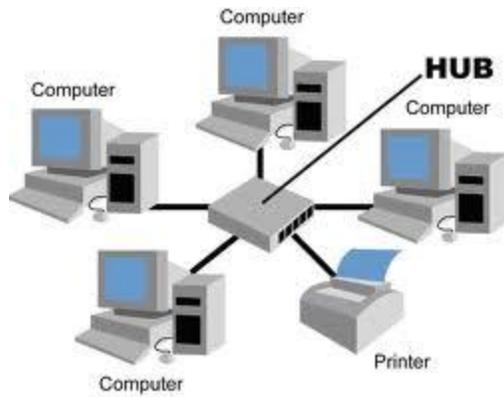
Ans:-9) Subnetting is a network design strategy that segregates a larger network into smaller components. While connected through the larger network, each subnetwork or subnet functions with a unique IP address. All systems that are assigned to a particular subnet will share values that are common for both the subnet and for the network as a whole.

Q:-10) What are different Network Topologies available. (May 2010)

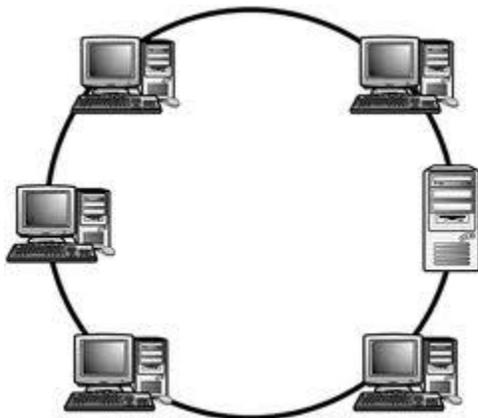
Ans:-10) Network Topology

A network topology describes the arrangement of systems on a computer network. It defines how the computers, or nodes, within the network are arranged and connected to each other. Some common network topologies include star, ring, line, bus, and tree configurations.

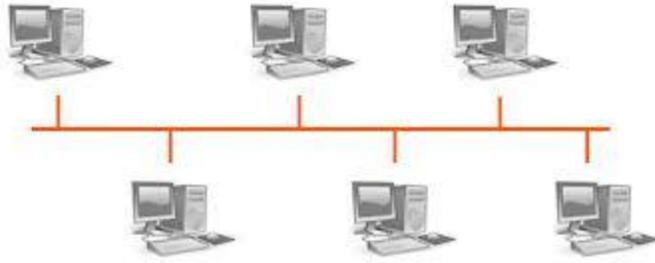
Star - One central node is connected to each of the other nodes on a network. Similar to a hub connected to the spokes in a wheel.



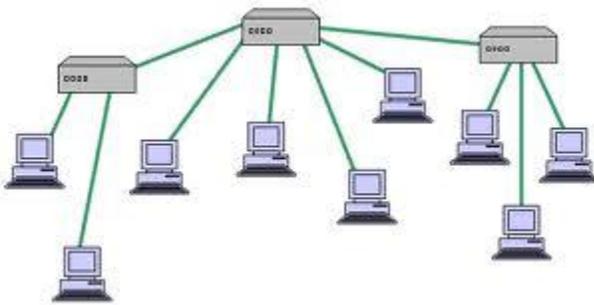
Ring - Each node is connected to exactly two other nodes, forming a ring. Can be visualized as a circular configuration. Requires at least three nodes.



Bus - Nodes are arranged in a line, where most nodes are connected to two other nodes.



Tree - One "root" node connects to other nodes, which in turn connect to other nodes, forming a tree structure. Information from the root node may have to pass through other nodes to reach the end nodes.



**Q:-11) Which method is used for Error correction at Data Link Layer?
(May 2010)**

Ans:-11) Hamming codes are used for Error correction at Data Link Layer.

Q:-12) Which IEEE standard is used for Wired and Wireless LANs?

(May 2010)

Ans:-12) IEEE 802.3 for Wired LAN

IEEE 802.11 for Wireless LAN

Q:-13) The channel allocation takes place at which layer of TCP/IP model?

(May 2010)

Ans:-13) The channel allocation takes place at HOST to Network Layer of TCP/IP model.

Q:-14) What is use of Reverse ARP? (May 2010)

Ans:-14) Reverse ARP or RARP (Reverse Address Resolution Protocol) is a network protocol that is used to obtain an IP address corresponding to a given hardware address commonly on the Ethernet networks. Like ARP which is a complementary protocol to the RARP, the RARP is not handled by the TCP/IP stack on the client, but is implemented separately.

For using the RARP each MAC (Media Access Control) address must be configured on a central server for it to convey an IP address.

Q:-15) What is the need of Subnet Mask? (May 2010)

Ans:-15) An IP address has two components, the network address and the host address. A **Subnet Mask** separates the IP address into the network and host addresses (<network><host>). Subnetting further divides the host part of an IP address into a subnet and host address (<network><subnet><host>). It is called a subnet mask because it is used to identify network address of an IP address by performing bitwise AND operation on the netmask.

Q:-16) Compare LAN and MAN? (Dec 2012)

Ans:-16) A **LAN** (local area network) is a group of computers and network devices connected together, usually within the same building. By definition, the connections must be high speed and relatively inexpensive.

A **MAN** (metropolitan area network) is a larger network that usually spans several buildings in the same city or town.

Q:-17) What are the disadvantages of Bus Topology? (Dec 2012)

Ans:-17) Disadvantages of Bus Topology

- Difficult to administer/troubleshoot.
- Limited cable length and number of stations.
- If there is a problem with the cable, the entire network goes down.
- Maintenance costs may be higher in the long run.
- Proper termination is required.(loop must be in closed path).

Q:-18) What is a Protocol? (Dec 2012)

Ans:-18) Protocol: - In information technology, a protocol is the special **set of rules** that end points in a telecommunication connection use when they communicate. Protocols specify interactions between the communicating entities.

Q:-19) What is the difference in UTP and STP Cable? (Dec 2012)

Ans:-19) UTP is Unshielded Twisted Pair. The majority of Ethernet networks utilize this type of cabling. As the name implies this cable doesn't have a shield to protect from electrical interference.

STP is Shielded Twisted Pair. It is the same as UTP but has a shield inside to protect from electrical interference. It should be used in Token Ring networks or in Ethernet networks where electrical interference may be a problem.

STP is more expensive and bulkier than UTP due to the shield.

Q:-20) Compare Router and Switch? (Dec 2012)

Ans:-20) Routers and **Switches** are both computer networking devices. They allow one or more **computers** to be connected to other computers, networked devices, or to other networks.

A **Router** is a device that forwards data packets between computer networks, creating an overlay internetwork. A router is connected to two or more data lines from different networks. When a data packet comes in one of the lines, the router reads the address information in the packet to determine its ultimate destination. Then, using information in its routing table or routing policy, it directs the packet to the next network on its journey.

A **Network Switch** is a small hardware device that joins multiple computers together within one local area network (LAN). Technically, network switches operate at layer two (Data Link Layer) of the OSI model.

Network switches appear nearly identical to network hubs, but a switch generally contains more intelligence (and a slightly higher price tag) than a hub. Unlike hubs, network switches are capable of inspecting data packets as they are received, determining the source and destination device of each packet, and forwarding them appropriately. By delivering messages only to the connected device intended, a network switch conserves network bandwidth and offers generally better performance than a hub.

Q:-21) Define the term Collision in data communication? (Dec 2012)

Ans:-21) Collision: - The situation that occurs when two or more devices attempt to send a signal along the same channel at the same time. The result

of a collision is generally a garbled message. All computer [networks](#) require some sort of mechanism to either prevent collisions altogether or to recover from collisions when they do occur.

Q:-22) What is Firewall? (Dec 2012)

Ans:-22) Firewall: - A system designed to prevent unauthorized access to or from a private network. Firewalls can be implemented in both hardware and software, or a combination of both. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet, especially *intranets*. All messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

Q:-23) What is CDMA? (Dec 2011)

Ans:-23) Code division multiple access (CDMA) is a channel access method used by various radio communication technologies.

One of the concepts in data communication is the idea of allowing several transmitters to send information simultaneously over a single communication channel. This allows several users to share a band of frequencies (see bandwidth). This concept is called multiple access. CDMA employs spread-spectrum technology and a special coding scheme (where

each transmitter is assigned a code) to allow multiple users to be multiplexed over the same physical channel.

Q:-24) How is HTTP related to WWW? (Dec 2011)

Ans:-24) HTTP is used mainly to access data on WWW. This protocol transfers data in the form of plain text, hypertext audio, video etc.

Q:-25) What do you mean by Spread Spectrum? (Dec 2011)

Ans:-25) In telecommunication and radio communication, **spread-spectrum** techniques are methods by which a signal (e.g. an electrical, electromagnetic, or acoustic signal) generated with a particular bandwidth is deliberately spread in the frequency domain, resulting in a signal with a wider bandwidth.

These techniques are used for a variety of reasons, including the establishment of secure communications, increasing resistance to natural interference, noise and jamming, to prevent detection.

Q:-26) Differentiate b/w Guided and Unguided Media? (Dec 2011)

Ans:-26) Guided media is that where we use any path for communication like cables (Coaxial, Fiber Optic, Twisted pair) etc.

Unguided media is also called wireless where no physical path is used for transmission Ex: - Microwave, Infrared etc.

Q:-27) What is switching? Discuss its types. (Dec 2010)

Ans:-27) In large networks there might be multiple paths **linking sender and receiver**. Information may be switched as it travels through various communication channels.

Types of Switching:-

Circuit switching

A type of communications in which a dedicated channel (or *circuit*) is established for the duration of a transmission. The most ubiquitous circuit-switching network is the telephone system, which links together wire segments to create a single unbroken line for each telephone call.

Packet switching

Refers to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message.

Message Switching

Message switching is a network switching technique in which data is routed in its entirety from the source node to the destination node, one hop at a time. During message routing, every intermediate switch in the network stores the whole message. If the entire network's resources are engaged or the network becomes blocked, the message-switched network stores and delays the message until ample resources become available for effective transmission of the message.

Q:-28) Give limitations of Parity checking. (Dec 2010)

Ans:-28) Limitations of Parity checking:-

- It is not suitable for detection of multiple Errors (two, four, six etc.)
- It cannot reveal the location of erroneous bit. It cannot correct the error either.

Q:-29) Write Functions of Media Access Control (MAC) Sub layer.
(Dec 2010)

Ans:-29) **Functions of MAC Sub Layer**

- To perform the control of access to media.
- It performs the unique addressing to stations directly connected to LAN.
- Detection of error.

Q:-30) What is Sliding Window protocols. (Dec 2010)

Ans:-30) **Sliding windows**, a technique also known as *windowing*, is used by the Internet's Transmission Control Protocol (TCP) as a method of controlling the flow of packets between two computers or network hosts. TCP requires that all transmitted data be acknowledged by the receiving host. Sliding windows is a method by which multiple packets of data can be affirmed with a single acknowledgment.

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