Model Answer

M.Sc. Ist semester Dec-2013

Subject- Introduction to information Technology

Q.No.1. Choose the correct answer

- UNIVAC Stands for
    - Universal Automatic Computer
    - Universal Automatic Calculator
    - Unified Automatic Computer
    - None of these

Ans:- Universal Automatic Computer

- Which operating system allow different part of single program to run concurrently
    - Multitasking
    - Multiuser
    - Multithreading
    - Multiprocessing

Ans:- Multithreading

- Which of the following topology required multipoint connection
    - Mesh
    - Ring
    - Star
    - Bus

Ans:- Mesh

- End to End delivery of entire message is responsibility of which layer
    - Datalink layer
    - Physical Layer
    - Network Layer
    - Transport Layer

Ans:- Transport Layer

- Secret key encryption involves use of

- One key
- Two Key
- Hash Function
- All of the above

Ans:- One key

- A method to provide for the secure transmission of E-mail is called
    - RSA
    - DES
    - BVD
    - PGP

Ans:- PGP

- GIS stands for
    - Global Information System
    - Geosynchronous Interchange System
    - Geographic Information System
    - None of above

Ans:- Global Information System

- GPRS stand for
    - General Packet Radio Service
    - General Packet Radio System
    - Geo Packet Radio Service
    - None of the above

Ans:- General Packet Radio Service

- ISP stands for
    - Internet Service Provider
    - Information Security Provider
    - Information Service Providers
    - None of the above

Ans:- Internet Service Provider

10. Which of the following will trigger at specified time or at occurrence of specified event?

- Trojan Horse

- Bomb
- Worm
- All of the above

Ans:- Bomb

Q.2 a. What are different characteristics of Fifth generation Computer?

In the fifth generation, the VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components. This generation is based on parallel processing hardware and AI (Artificial Intelligence) software. AI is an emerging branch in computer science which interprets means and methods of making computers think like human beings.All the higher level languages like C and C++, Java, .Net, etc., are used in this generation.

AI includes:

- Robotics
- Neural networks
- Game Playing
- Development of expert systems to make decisions in real life situations.
- Natural language understanding and generation.

The main features of Fifth Generation are:

- ULSI technology
- Development of true artificial intelligence
- Development of Natural language processing
- Advancement in Parallel Processing
- Advancement in Superconductor technology
- More user friendly interfaces with multimedia features
- Availability of very powerful and compact computers at cheaper rates

Some computers types of this generation are:

- Desktop
- Laptop
- NoteBook
- UltraBook
- ChromeBook

b. What is optical disk? Explain different type of optical disk?

A storage medium from which data is read and to which it is written by lasers. Optical disks can store much more data -- up to 6 gigabytes (6 billion bytes) -- than most portable magnetic media, such as floppies. There are three basic types of optical disks:

- **CD-ROM :** Like audio CDs, CD-ROMs come with data already encoded onto them. The data is permanent and can be read any number of times, but CD-ROMs cannot be modified.
- **WORM :** Stands for *write-once, read -many.* With a WORM disk drive, you can write data onto a WORM disk, but only once. After that, the WORM disk behaves just like a CD-ROM.
- **erasable:** Optical disks that can be erased and loaded with new data, just like magnetic disks. These are often referred to as *EO*(**e**rasable **o**ptical) disks.

These three technologies are not compatible with one another; each requires a different type of disk drive and disk. Even within one category, there are many competing formats, although CD-ROMs are relatively standardized.

Q.3 What are different function performed by following layer of OSI model? Explain?

1. Physical Layer –

Encapsulation

Figure 2.3 reveals another aspect of data communications in the OSI model: encapsulation. A packet (header and data) at level 7 is encapsulated in a packet at level 6. The whole packet at level 6 is encapsulated in a packet at level 5, and so on.

In other words, the data portion of a packet at level $N - 1$ carries the whole packet (data and header and maybe trailer) from level N. The concept is called *encapsulation;* level $N - 1$ is not aware of which part of the encapsulated packet is data and which part is the header or trailer. For level $N - 1$, the whole packet coming from level N is treated as one integral unit.

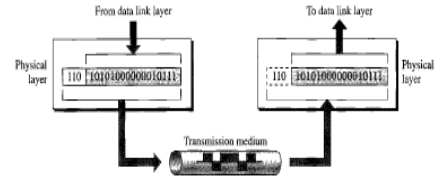
2.3 LAYERS IN THE OSI MODEL

In this section we briefly describe the functions of each layer in the OSI model.

Physical Layer

The **physical layer** coordinates the functions required to carry a bit stream over a physical medium. It deals with the mechanical and electrical specifications of the interface and transmission medium. It also defines the procedures and functions that physical devices and interfaces have to perform for transmission to occur. Figure 2.5 shows the position of the physical layer with respect to the transmission medium and the data link layer.

Figure 2.5 *Physical layer*



The physical layer is responsible for movements of individual bits from one hop (node) to the next.

The physical layer is also concerned with the following:

- **Physical characteristics of interfaces and medium.** The physical layer defines the characteristics of the interface between the devices and the transmission medium. It also defines the type of transmission medium.
- **Representation of bits.** The physical layer data consists of a stream of **bits** (sequence of 0s or 1s) with no interpretation. To be transmitted, bits must be

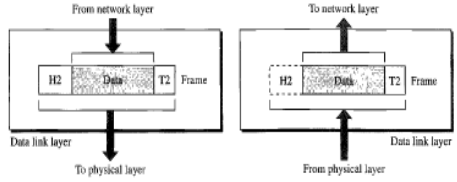
encoded into signals—electrical or optical. The physical layer defines the type of **encoding** (how 0s and 1s are changed to signals).

- **Data rate.** The **transmission rate**—the number of bits sent each second—is also defined by the physical layer. In other words, the physical layer defines the duration of a bit, which is how long it lasts.
- **Synchronization of bits.** The sender and receiver not only must use the same bit rate but also must be synchronized at the bit level. In other words, the sender and the receiver clocks must be synchronized.
- **Line configuration.** The physical layer is concerned with the connection of devices to the media. In a point-to-point configuration, two devices are connected through a dedicated link. In a multipoint configuration, a link is shared among several devices.
- **Physical topology.** The physical topology defines how devices are connected to make a network. Devices can be connected by using a mesh topology (every device is connected to every other device), a star topology (devices are connected through a central device), a ring topology (each device is connected to the next, forming a ring), a bus topology (every device is on a common link), or a hybrid topology (this is a combination of two or more topologies).
- **Transmission mode.** The physical layer also defines the direction of transmission between two devices: simplex, half-duplex, or full-duplex. In simplex mode, only one device can send; the other can only receive. The simplex mode is a one-way communication. In the half-duplex mode, two devices can send and receive, but not at the same time. In a full-duplex (or simply duplex) mode, two devices can send and receive at the same time.

Data Link Layer

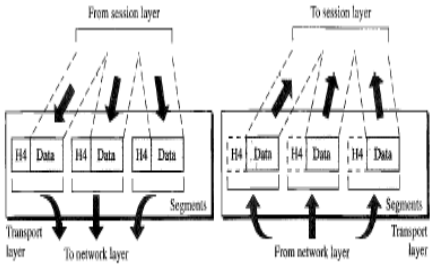
The **data link layer** transforms the physical layer, a raw transmission facility, to a reliable link. It makes the physical layer appear error-free to the upper layer (network layer). Figure 2.6 shows the relationship of the data link layer to the network and physical layers.

Figure 2.6 *Data link layer*



Transport Layer

Figure 2.10 *Transport layer*



The transport layer is responsible for the delivery of a message from one process to another.

Other responsibilities of the transport layer include the following:

- **Service-point addressing.** Computers often run several programs at the same time. For this reason, source-to-destination delivery means delivery not only from one computer to the next but also from a specific process (running program) on one computer to a specific process (running program) on the other. The transport layer header must therefore include a type of address called a *service-point address* (or port address). The network layer gets each packet to the correct computer; the transport layer gets the entire message to the correct process on that computer.
- **Segmentation and reassembly.** A message is divided into transmittable segments, with each segment containing a sequence number. These numbers enable the transport layer to reassemble the message correctly upon arriving at the destination and to identify and replace packets that were lost in transmission.
- **Connection control.** The transport layer can be either connectionless or connection-oriented. A connectionless transport layer treats each segment as an independent packet and delivers it to the transport layer at the destination machine. A connection-oriented transport layer makes a connection with the transport layer at the destination machine first before delivering the packets. After all the data are transferred, the connection is terminated.
- **Flow control.** Like the data link layer, the transport layer is responsible for **flow control.** However, flow control at this layer is performed end to end rather than across a single link.
- **Error control.** Like the data link layer, the transport layer is responsible for **error control.** However, error control at this layer is performed process-to-process rather than across a single link. The sending transport layer makes sure that the entire message arrives at the receiving transport layer without **error** (damage, loss, or duplication). Error correction is usually achieved through retransmission.

Q.No.4 What is the maximum number of subnet of class C using following mask

a. 255.255.192.0

Ans- Not a valid mask for class C Address

b.255.192.0.0

Ans- Not a valid mask for class C Address

c.255.255.254.0

Ans- Not a valid mask for class C Address

d.255.255.255.0

Ans- 1

Q.No. 5 a Explain working of search engine?

A **web search engine** is a software system that is designed to search for information on the World Wide Web. The search results are generally presented in a line of results often referred to as search engine results pages (SERPs). The information may be a specialist inweb pages, images, information and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler.

A search engine operates in the following order:

- Web crawling
- Indexing
- Searching

Web search engines work by storing information about many web pages, which they retrieve from the HTML markup of the pages. These pages are

retrieved by a Web crawler (sometimes also known as a spider) — an automated Web crawler which follows every link on the site.

The search engine then analyzes the contents of each page to determine how it should be indexed (for example, words can be extracted from the titles, page content, headings, or special fields called meta tags). Data about web pages are stored in an index database for use in later queries. A query from a user can be a single word. The index helps find information relating to the query as quickly as possible. Some search engines, such as Google, store all or part of the source page (referred to as a cache) as well as information about the web pages, whereas others, such as AltaVista, store every word of every page they find. This cached page always holds the actual search text since it is the one that was actually indexed, so it can be very useful when the content of the current page has been updated and the search terms are no longer in it.

When a user enters a query into a search engine (typically by using keywords), the engine examines its index and provides a listing of best-matching web pages according to its criteria, usually with a short summary containing the document's title and sometimes parts of the text.

The usefulness of a search engine depends on the relevance of the **result set** it gives back. While there may be millions of web pages that include a particular word or phrase, some pages may be more relevant, popular, or authoritative than others. Most search engines employ methods to rank the results to provide the "best" results first

b. What is M-Commerce?

The delivery of electronic commerce capabilities directly into the consumer's hand, anywhere, via wireless technology. Many choose to think of Mobile Commerce as meaning "a retail outlet in your customer's pocket."

Products and services available

Mobile Money Transfer

Mobile ATM

Mobile ticketing

Mobile vouchers, coupons and loyalty cards

Content purchase and delivery
Location-based services

- Local discount offers
- Local weather
- Tracking and monitoring of people

Information services

A wide variety of information services can be delivered to mobile phone users in much the same way as it is delivered to PCs. These services include:

- News
- Stock quotes
- Sports scores
- Financial records
- Traffic reporting

Mobile Banking.

Mobile brokerage

Auctions

Mobile browsing

Mobile purchase

In-application mobile phone payments

Mobile marketing and advertising

Influence on youth markets

Q.No.6 (a)What are methods used to propagate radio waves?

Ans:- Following are methods of propagation of radio waves

1. Surface Propagation-In this type of propagation radio waves travels through the lowest portion of atmosphere, hugging the earth.

2. Troposphere Propagation- this propagation works in two ways, first either a signal can directed in a straight line from antenna to antenna or it can be broadcast at an angle into upper layer of troposphere where it it is reflected back down to the earth surface.

3. Inospheric Propagation – In this type of propagation higher frequency radio waves radiate upward into ionosphere where they are reflected back to the earth.

4. Line of Sight- In this propagation very high frequency signals are transmitted in straight line directly from antenna to antenna. Antenna must be directional , facing each other.

5. Space Propagation- Space propagation utilize satellite relays in place of atmospheric reflection.

(b) Why the communication satellite are in geosynchronous orbit?

Ans:-To ensure constant communication, satellite must moved at the speed as the earth so it seems to remain fixed above a certain spot. Such satellite are called geosynchronous. Because orbital speed is based on distance from the planet, only one orbit can be geosynchronous. This orbit occurs at the equatorial plane and is approximately 22,000 miles from the surface of the earth.

(C)What are the three criteria used to evaluate transmission media?

Ans- Following are three criteria used to evaluate the transmission media

1. Throughput- The throughput is the measurement of how fast data can pass through a point

2. Propagation speed- Propagation speed measures the distance a signal or a bit can travel through a medium in one second.

3. Propagation time- Propagation time measures the time required for a

signal to travel from one point of transmission medium to another.

Other criteria can be cost, speed, security, EMI and attenuation.

(D)What are types of transmission impairment?s

Ans. There are three types of transmission impairment

1. Attenuation – Attenuation means loss of energy. When a signal travels through a medium, it losses some of its energy so that it can overcome the resistance of the medium

2. Distortion- Distortion means signal changes it from or shape. Distortion occurs in a composite signal , made of different frequencies.

3. Noise- Noise is addition of unwanted signals in original signal.There are several types of noise like thermal noise, induced noise, cross talk and impulse noise.

Q.No.7 (a) Explain synchronous and asynchronous transmission?

Asynchronous Transmission

Asynchronous communication utilizes a transmitter, a receiver and a wire without coordination about the timing of individual bits. There is no coordination between the two end points on just how long the transmiter leaves the signal at a certain level to represent a single digital bit. Each device uses a clock to measure out the 'length' of a bit. The transmitting device simply transmits. The receiving device has to look at the incoming signal and figure out what it is receiving and coordinate and retime its clock to match the incoming signal.

Sending data encoded into your signal requires that the sender and receiver are both using the same encoding/decoding method, and know where to look in the signal to find data. Asynchronous systems do not send

separate information to indicate the encoding or clocking information. The receiver must decide the clocking of the signal on it's own. This means that the receiver must decide where to look in the signal stream to find ones and zeroes, and decide for itself where each individual bit stops and starts. This information is not in the data in the signal sent from transmitting unit.

When the receiver of a signal carrying information has to derive how that signal is organized without consulting the transmitting device, it is called asynchronous communication. In short, the two ends do not always negotiate or work out the connection parameters before communicating. Asynchronous communication is more efficient when there is low loss and low error rates over the transmission medium because data is not retransmitted and no time is spent setting negotiating the connection parameters at the beginning of transmission. Asynchronous systems just transmit and let the far end station figure it out. Asynchronous is sometimes called "best effort" transmission because one side simply transmits, and the other does it's best to receive and any lost data is recovered by a higher level protocol.

Synchronous Transmission

Synchronous systems negotiate the communication parameters at the data link layer before communication begins. Basic synchronous systems will synchronize the signal clocks on both sides before transmission begins, reset their numeric counters and take other steps. More advanced systems may negotiate things like error correction and compression.

It is possible to have both sides try to synchronize the connection at the same time. Usually, there is a process to decide which end should be in control. Both sides in synchronous communication can go through a lengthy negotiation cycle where they exchange communications parameters and status information. With a lengthy connection establishment process, a synchronous system using an unreliable physical connection will spend a great deal of time in negotiating, but not in actual data transfer. Once a

connection is established, the transmitter sends out a signal, and the receiver sends back data regarding that transmission, and what it received. This connection negotiation process takes longer on low error-rate lines, but is highly efficient in systems where the transmission medium itself (an electric wire, radio signal or laser beam) is not particularly reliable.

(b) Explain following

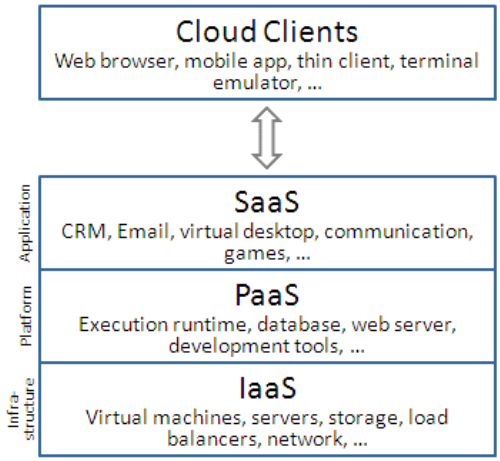
(i) Domain Name System

The **Domain Name System** (**DNS**) is a hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most prominently, it translates easily memorized domain names to the numericalIP addresses needed for the purpose of locating computer services and devices worldwide.

(ii) Cloud computing

Cloud computing is a phrase used to describe a variety of **computing** concepts that involve a large number of computers connected through a real-time communication network such as the Internet.[1] In science, cloud computing is a synonym for distributed computingover a network, and means the ability to run a program or application on many connected computers at the same time.

Service models



Infrastructure as a service (IaaS)

In the most basic cloud-service model, providers of IaaS offer computers – physical or (more often) virtual machines – and other resources. (Ahypervisor, such as Hyper-V or Xen or KVM or VMware ESX/ESXi, runs the virtual machines as guests.

Platform as a service (PaaS)

In the PaaS model, cloud providers deliver a computing platform, typically including operating system, programming language execution environment, database, and web server. Application developers can develop and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers.

Software as a service (SaaS)

In the business model using software as a service (SaaS), users are provided access to application software and databases. Cloud providers manage the infrastructure and platforms that run the applications. SaaS is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis. SaaS providers generally price applications using a subscription fee.

In the SaaS model, cloud providers install and operate application software in the cloud and cloud users access the software from cloud clients. Cloud users do not manage the cloud infrastructure and platform where the application runs