

Information Technology (3rd Batch)

Long Questions

1. What do you mean by Internet? Explain the advantages and disadvantages of internet.

The term Internet refers to the global network of public computers running Internet Protocol. In other words, the Internet, sometimes called simply “the Net,” is a worldwide system of computer networks that allows users to send and receive information from other computers.

Following are the advantages provided by the Internet:

- **Information:** The biggest benefit offered by the Internet is information. It functions as a valuable resource of information. You can find any type of information on any subject with the help of the search engines like Yahoo and Google.
- **Communication:** The primary goal of the Internet is communication. It has done extremely well in this field, however the development process is still going on to make it more dependable and quick. By sending an e-mail, we can contact a person who is physically present thousand miles away within the fraction of a second’s time.
- **Entertainment:** Internet functions as a popular medium of entertainment. A wide variety of entertainment including video games, music, movies, chat room, news and others can be accessed through the Internet.
- **E-commerce:** E-commerce is the idea that is implemented for any form of commercial strategy or business transactions that entails transmission of data from one corner of the world to another. E-commerce has become a fantastic option through which you can shop anything.
- **Formation of communities:** Internet helps in formation of communities or forums. Here a number of people can participate in different types of debates and discussions, express their views and gather valuable knowledge.
- **Services:** A variety of services are offered via Internet, for example job searching, online banking, buying movie tickets, hotel reservations and consultation services etc. When you avail these services offline, they become more expensive.

Following are the disadvantages of Internet:

- **Spamming:** Spamming denotes distribution of unsolicited e-mails in large numbers. They are meaningless and they unnecessarily block the whole system. These activities are treated as illegal.
- **Theft of personal details:** While using the Internet, there is high probability that your personal details like name, address and credit card number may be accessed by con artists and used for fraudulent purposes.
- **Pornography:** Pornography is definitely harmful for your children. There are numerous pornographic sites available over the Internet and watching any of those can have very bad influence on the mental health of your children.
- **Virus threat:** Virus is a program that interrupts the usual operation of your personal computer system. PCs linked to the Internet have high probability of virus attacks and as a result of this your hard disk can crash, giving you a lot of trouble.

2. Explain the functions of an Operating System.

Operating System is an important system software package found in every computer systems. It is a set of programs that controls and supervises computer system's hardware and it provides services to computer users. It permits the computer to supervise its own operations by automatically calling in application programs and managing data needed to produce the output desired by users. OS is an interface between the user and the computer. OS perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printers. OS, as a resource manager keeps track of who is using which resource, to grant resource requests, to account for usage and to mediate conflicting requests from different programs and users. Most commonly used operating systems include Microsoft Windows, DOS, Xenix, Mac OS, OS/2, UNIX, MVS, etc.

Functions of an Operating System:

Job Management: OS manages the jobs waiting to be processed. It recognizes the jobs, identifies their priorities, determines whether the appropriate main memory and secondary storage capability they require is available, and schedules and finally runs each job at the appropriate moment.

Batch Processing: Data are accumulated and processed in groups. The printing tasks in the printer are also done in groups. Most of the tasks of OS are grouped and performed one by one.

On-line Processing: In on-line processing, data are processed instantaneously. Most on-line operating systems have multi-user and multitasking capabilities. Now days we can access the data from the remote sites using on-line processing.

Data Management: OS manages the storage and retrieval of data. As the system software handles many of the details associated with this process, such details are not a primary concern for users or programmers writing application programs.

Virtual Storage: Using this method the capacity of main memory increases without actually increasing its size. This is done by breaking a job into sequences of instructions, called pages or segments, and keeping only a few of these in main memory at a time; the remaining are kept on secondary storage devices. Thus, relatively large jobs can be processed by a CPU.

Input/ Output Management: OS manages the input to and output from a computer system. This applies to the flow of data among computers, terminals, and other devices such as printers. Application programs used the operating system extensively to handle input and output devices as needed.

Function of operating system can be further listed as follows:

- user interface implementation
- share hardware implementation
- allows users to share data

- prevent users from interfering with one another
- scheduling resources among users
- facilitate input/output
- facilitate parallel operations
- organize data for secure and rapid access
- handle network communications

3. What are the major characteristics of computer? Explain.

The major characteristics of computer are explained here below:

- **Speed:** As you know computer can work very fast. It takes only few seconds for calculations that we take hours to complete. You will be surprised to know that computer can perform millions (1,000,000) of instructions and even more per second. Therefore, we determine the speed of computer in terms of microsecond (10 to the power -6 part of a second) or nanosecond (10 to the power -9 part of a second). From this you can imagine how fast your computer performs work.
- **Accuracy:** The degree of accuracy of computer is very high and every calculation is performed with the same accuracy. The accuracy level is 7 determined on the basis of design of computer. The errors in computer are due to human and inaccurate data.
- **Diligence:** A computer is free from tiredness, lack of concentration, fatigue, etc. It can work for hours without creating any error. If millions of calculations are to be performed, a computer will perform every calculation with the same accuracy. Due to this capability it overpowers human being in routine type of work.
- **Versatility:** It means the capacity to perform completely different type of work. You may use your computer to prepare payroll slips. Next moment you may use it for inventory management or to prepare electric bills.
- **Power of Remembering:** Computer has the power of storing any amount of information or data. Any information can be stored and recalled as long as you require it, for any numbers of years. It depends entirely upon you how much data you want to store in a computer and when to lose or retrieve these data.
- **No IQ:** Computer is a dumb machine and it cannot do any work without instruction from the user. It performs the instructions at tremendous speed and with accuracy. It is you to decide what you want to do and in what sequence. So a computer cannot take its own decision as you can.
- **No Feeling:** It does not have feelings or emotion, taste, knowledge and experience. Thus it does not get tired even after long hours of work. It does not distinguish between users.
- **Storage:** The Computer has an in-built memory where it can store a large amount of data. You can also store data in secondary storage devices such as floppies, which can be kept outside your computer and can be carried to other computers.

Short Questions

4. What is the function of memory?

People in the computer industry commonly use the term “memory” to refer to RAM (Random Access Memory). A computer uses RAM to hold temporary instructions and data needed to complete tasks. This enables the computer’s CPU (Central Processing Unit), to access instructions and data stored in memory very quickly. A good example of this is when the CPU loads an application program – such as a word processing or page layout program – into memory, thereby allowing the application program to work as quickly and efficiently as possible. In practical terms, having the program loaded into memory means you can get work done more quickly with less time spent waiting for the computer to perform tasks. The process begins when you enter a command from your keyboard. The CPU interprets the command and instructs the hard drive to load the command or program into memory. Once the data is loaded into memory, the CPU is able to access it much more quickly than if it had to retrieve it from the hard drive. This process of putting things the CPU needs in a place where it can get at them more quickly is similar to placing various electronic files and documents you’re using on the computer into a single file folder or directory. By doing so, you keep all the files you need handy and avoid searching in several places every time you need them.

5. Describe the working principle of processor.

The processor is the heart of the entire computer system. It performs computations, executes instructions and transfer information to all the parts of a computer. An instruction is fetched from primary storage by the Control Unit; The Control Unit decodes the instruction; The ALU receives the data and the instruction and performs the calculation or comparison; the result is stored in primary storage which is sent to the proper output device.

Control Unit:

- Access program instructions
- Decode (interpret) instructions
- Control flow of data throughout system
- Data flows through paths called buses

Arithmetic-Logic Unit:

- Perform computations on data
- Perform comparisons on data

Registers:

- High speed storage areas
- Hold data and instructions

Primary Storage (Main Memory):

- Stores instructions from programs

- Stores data to be processed

6. Differentiate between random access devices and sequential access device.

- In sequential access, data is stored at random locations whereas in direct access, data is stored at sequential locations.
- In sequential access, addition of data is fast but retrieval of data is slow whereas in direct access, addition of data is slow as reordering of data blocks may be needed to put current data block after the last used data block for the file. But retrieval of data is fast.
- Data structure implementing Sequential access is linked list whereas data structure implementing direct access is an Array.
- A situation where rate of addition of data is much larger compared to retrieval of data Sequential access is preferred; in opposite situation direct access is more suitable.

7. What are the different kinds of input devices?

In computing, an input device is any peripheral (piece of computer hardware equipment) used to provide data and control signals to an information processing system such as a computer or other information appliance. In other words, an input device is a peripheral device that converts symbols that people understand into bits that computers can process. Few input devices are: Keyboard, Mouse, Scanners, Digital cameras, Microphone, Digitizing Tablet (used in GIS application), Bar Code Reader, Stylus pen, Joystick, Track ball, OCR (Optical Character Reader), MICR (Magnetic Ink Character Reader) etc.

8. What is system software?

Software is a collection of set of programs, which are used to execute all kinds of specific instruction. It consists of a number of machine instructions, array in a specific order to perform a particular task. Software is used to describe all the programs and its associated documents which run on a computer. Software means computer instructions or data. Anything that can be stored electronically is software. Firmware is software (programs or data) that has been permanently written onto read-only memory (ROM). All software falls into two general types or categories: System Software and Application Software. *System software* consists of low-level programs that interact with the computer at very basic level. This includes operating systems, compilers, and utilities for managing resources.

9. What do you mean by multiprocessing?

Multiprocessing is the coordinated processing of programs by more than one computer processor. Multiprocessing is a general term that can mean the dynamic assignment of a program to one of two or more computers working in tandem or can involve multiple computers working on the same program at the same time (in parallel). Most of new computers have dual-core processors, or feature two or more processors; therefore they are called multiprocessor computers. There are many variations on this basic theme, and the definition of multiprocessing can vary with context, mostly as a function of how CPUs are defined (multiple cores on one die,

multiple chips in one package, multiple packages in one system unit, etc.). Multiprocessing sometimes refers to the execution of multiple concurrent software processes in a system as opposed to a single process at any one instant.

10. Differentiate between third generation language and fourth generation languages.

A third generation (programming) language (3GL) is a grouping of programming languages that introduced significant enhancements to second generation languages, primarily intended to make the programming language more programmer-friendly. English words are used to denote variables, programming structures and commands, and Structured Programming is supported by most 3GLs. Commonly known 3GLs are FORTRAN, BASIC, Pascal and the C-family (C, C+, C++, C#, Objective-C) of languages.

A fourth generation (programming) language (4GL) is a grouping of programming languages that attempt to get closer than 3GLs to human language, form of thinking and conceptualization. 4GLs are designed to reduce the overall time, effort and cost of software development. The main domains and families of 4GLs are: database queries, report generators, data manipulation, analysis and reporting, screen painters and generators, GUI creators, mathematical optimization, web development and general purpose languages.

11. What do you mean by normalization?

Normalization is the process of building database structures to store data. Normalization is a formal process of developing data structures in a manner that eliminates redundancy and promotes integrity. Data normalization is a corner stone of the relational theory. In relational database design, the process of organizing data to minimize redundancy is called normalization. Normalization usually involves dividing a database into two or more tables and defining relationships between the tables. The objective is to isolate data so that additions, deletions, and modifications of a field can be made in just one table and then propagated through the rest of the database via the defined relationships. There are three main normal forms, each with increasing levels of normalization: First Normal Form (1NF), Second Normal Form (2NF), and Third Normal Form (3NF). There are additional normalization levels, such as Boyce Codd Normal Form (BCNF), fourth normal form (4NF) and fifth normal form (5NF). While normalization makes databases more efficient to maintain, they can also make them more complex because data is separated into so many different tables.

12. What do you mean by TCP/IP and how does it work?

TCP/IP is the communication protocol for communication between computers on the Internet. TCP/IP stands for Transmission Control Protocol / Internet Protocol. TCP/IP defines how electronic devices (like computers) should be connected to the Internet, and how data should be transmitted between them.

The TCP/IP model consists of the link layer, the Internet layer, the transport layer and the application layer. Each layer consists of a set of protocols that function on the level of that layer. The link layer protocols are responsible for connecting the nodes in a network. The Internet layer consists of protocols, specifications and methods that are used to transport data packets across

the network. The transport layer protocols deal with the transmission of data packets between source and destination network hosts. The application layer, the topmost layer in TCP/IP, directly interacts with application services. Thus, we see that TCP/IP functions at all the levels of communication between the components of a network. It is truly, the heart of network communication.

13. What are the major characteristics of the Intranet?

The major characteristics of the intranet are listed here below:

- **Communication:** The intranet must support various communication channels, such as information from the management team concerning strategic aspects of their organization or collaboration amongst project teams and departments.
- **Maintenance and Updating:** It is inevitable that your intranet will require frequent updating and maintenance to ensure that the information provided is both relevant and accurate. Adding an image or changing content should not be a difficult process, nor should it be time-consuming.
- **Analyzing your Intranet:** You may not have time to monitor the entire intranet, and this may not be something that as a company you would be interested in. However knowing which documents are popular and what users are searching for provides you with an insightful window into future improvements.
- **Search:** An effective search function is important in building and maintaining trust with the corporate intranet.
- **Business Processes:** For some organizations the need for electronic forms and workflows on the intranet may not be immediately obvious. It is only when a breakdown in the ability to effectively and efficiently perform processes that an alternative is sought.