

Model Answer paper
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Fundamentals of Computers
Paper Code: BC-307

Section- A

- What are the basic 3 part of the computer?

Ans: processor and memory chips, input/output devices, tapes, disks, modems, cable etc.

- How many disks are present in one hard disk?

Ans: It depends upon manufacturer needs.

- What is impact printer?

Ans: Impact printers are one of the primary categories of printer technology. Basically, they use a mechanism that touches the paper to form an image. The two main kinds of impact printers are:

Dot matrix: These printers use tiny pins to transfer the ink from a ribbon to a piece of paper.

Character: These printers are just computerized typewriters. They use a series of bars or a ball that contains embossed characters. Ink is transferred to the paper when the character strikes an ink ribbon. They produce sharp text but can't be used for much else.

- What is program?

Ans:- Program is a set of instructions for a computer to perform a specific task. Programs generally fall into these categories applications, utilities or services.

Programs are written in a programming language then translated into machine code by a compiler and linker so that the computer can execute it directly or run it line by line by an interpreter program.

- What is software?

Ans: Software is a general term used to describe a collection of computer programs, procedures and documentation that perform some tasks on a computer system.

- List the 3 translator's name.

Ans: Compiler, Assembler, Interpreter.

- When we use the secondary memory?

Ans: secondary memory or external memory, is used to store a large amount of data at lesser cost per byte

than primary memory. They are two orders of magnitude less expensive than primary storage. In addition, secondary storage does not lose the data when the device is powered down

- What's the meaning of off-line devices?

Ans: Offline is the condition of being capable of but currently not connected to a network of computers or other devices. The term is frequently used to describe someone who has the ability to be connected to the Internet but who is not currently connected to it.

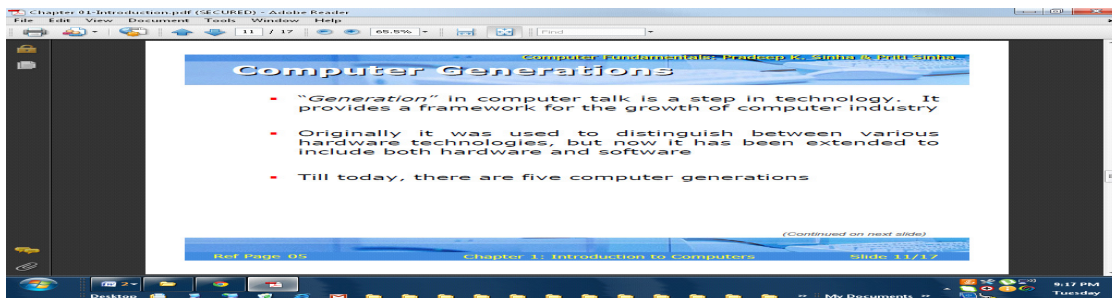
- What is EPROM?

Ans: EPROM (erasable programmable read-only memory) is programmable read-only memory (programmable ROM) that can be erased and re-used. Erasure is caused by shining an intense ultraviolet light through a window that is designed into the memory chip.

- What is virus detection?

Ans: any technique designed to monitor a computersystem for unauthoriz
o software applications and causedamage or data loss

Section- B



What is "Generation" in computer terminology? List various generations and explain some characteristics of first generation computer.

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Computer Generations

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Generation (Period)	Key hardware technologies	Key software technologies	Key characteristics	Some representative systems
First (1942-1955)	<ul style="list-style-type: none"> Vacuum tubes Electromagnetic relay memory Punched cards secondary storage 	<ul style="list-style-type: none"> Machine and assembly languages Stored program concept Mostly scientific applications 	<ul style="list-style-type: none"> Bulky in size Highly unreliable Limited commercial use and costly Difficult commercial production Difficult to use 	<ul style="list-style-type: none"> ENIAC EDVAC EDSAC UNIVAC I IBM 701
Second (1955-1964)	<ul style="list-style-type: none"> Transistors Magnetic cores Magnetic tapes Disks for secondary storage 	<ul style="list-style-type: none"> Batch operating system High-level programming languages Scientific and commercial applications 	<ul style="list-style-type: none"> Faster, smaller, more reliable and easier to program than previous generation systems Commercial production was still difficult and costly 	<ul style="list-style-type: none"> Honeywell 400 IBM 7030 CDC 3600 UNIVAC LARC

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Computer Generations

(Continued from previous slide...)

Generation (Period)	Key hardware technologies	Key software technologies	Key characteristics	Some rep. systems
Third (1964-1975)	<ul style="list-style-type: none"> ICs with SSI and MSI technologies Larger magnetic cores memory Larger capacity disks and magnetic tapes secondary storage Minicomputers; upward compatible family of computers 	<ul style="list-style-type: none"> Timesharing operating system Standardization of high-level programming languages Unbundling of software from hardware 	<ul style="list-style-type: none"> Faster, smaller, more reliable, easier and cheaper to produce to use, and easier to upgrade than previous generation systems Scientific, commercial and interactive on-line applications 	<ul style="list-style-type: none"> IBM 360/370 PDP-8 PDP-11 CDC 6600

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Computer Generations

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Generation (Period)	Key hardware technologies	Key software technologies	Key characteristics	Some rep. systems
Fourth (1975-1989)	<ul style="list-style-type: none"> ICs with VLSI technology Microprocessors; semiconductor memory Larger capacity hard disks as in-built secondary storage Magnetic tapes and floppy disks as portable storage media Personal computers Supercomputers based on parallel vector processing multiprocessing technologies Spread of high-speed computer networks 	<ul style="list-style-type: none"> Operating systems for PCs with GUI and multiple windows on a single terminal screen Multiprocessing OS with concurrent programming languages UNIX operating system with C programming language Object-oriented design and programming PC, Network-based, and supercomputing applications 	<ul style="list-style-type: none"> Small, affordable, reliable, and easy to use PCs More powerful and reliable systems and supercomputers Totally general purpose machines Easier to produce commercially Easier to upgrade Rapid software development possible 	<ul style="list-style-type: none"> IBM PC and its clones Apple II TRS-80 VAX 9000 CRAY-1 CRAY-2 CRAY-X/MP

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Computer Generations

(Continued from previous slide...)

Generation (Period)	Key hardware technologies	Key software technologies	Key characteristics	Some rep. systems
Fifth (1989-Present)	<ul style="list-style-type: none"> ICs with ULSI technology Larger capacity main memory, hard disks with RAID support Optical disks as portable read-only storage media Notebooks, powerful desktop PCs Powerful servers, supercomputers Internet Cluster computing 	<ul style="list-style-type: none"> Micro-kernel based, multithreading, distributed OS Parallel programming libraries like MPI & PVM JAVA World Wide Web Multimedia, Internet applications More complex supercomputing applications 	<ul style="list-style-type: none"> Portable computers Powerful, cheaper, reliable, and easier to use desktop machines Powerful supercomputers High uptime due to hot-pluggable components Totally general purpose machines Easier to produce commercially Easier to upgrade Rapid software development possible 	<ul style="list-style-type: none"> IBM notebooks Pentium PCs SUN Workstations IBM SP/2 SCI Origin 2000 PARAM 10000

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- Keyboard is which type of device. Explain different keys used in a keyboard.

Ans: a **keyboard** is a [typewriter-style device](#), which uses an arrangement of buttons or [keys](#), to act as mechanical levers or electronic switches. Following the decline of punch and [paper tape](#), interaction via [teleprinter](#)-style keyboards became the main [input device](#) for computers.

[Key types](#)

[1 Alphanumeric](#)

All keys should be described in detail.

[2 Modifier keys](#)

[3 Cursor keys](#)

[4 System commands](#)

[5 Miscellaneous](#)

- Differentiate among RAM, ROM, PROM, and EPROM.

Ans: RAM is short for Random Access Memory. It's the main memory your system uses to handle the programs and data it's currently running and working on. It comes in two kinds--DRAM (Dynamic Random Access Memory) and SRAM (Static Random Access Memory). SRAM is MUCH faster, DRAM is MUCH cheaper. The "RAM sticks" you purchase to upgrade your computer are all DRAM. All those names (SDRAM, RDRAM, DDR, DDR2, etc. are just variations on DRAM technology, and they are packaged on differently-shaped sticks and have different voltage requirements, which is why you cannot put SDRAM in a DDR2 system or any other crazy combination.

ROM is Read-Only Memory. It comes in many forms (CD-ROM, flash ROM, etc.). All it means is memory that can be read from, but not written to. That's why you can't re-write stuff to a CD-ROM. It's "read-only". The data it contains is encoded into it when it's constructed and it cannot be changed.

PROM is Programmable Read-Only Memory. It is able to be written to by certain means (not by the computer; you need special equipment) but it cannot be erased or re-written. Technically a CD-ROM is PROM, since is programmed by the laser in your CD burner "burning" the data into it.

EPROM is Erasable Programmable Read-Only Memory. It can be erased and re-written to--but still not by the computer, only by special methods.

- What is system software? Describe different types of system software's.
Modern computers are complex instruments involving many different parts. To keep it running well you will need system software. System software will handle the smooth running of all the components of the computer as well as providing general functionality for other programs to use, tools to speed up the computer, tools to develop new software and programs to keep you safe from attacks. There are several different types of system software that we will look at in more detail very shortly:
- **Operating Systems** are a collection of programs that *make the computer hardware conveniently available to the user* and also *hide the complexities of the computer's operation*. The Operating System (such as Windows 7 or Linux) interprets commands issued by application software (e.g. word processor and spreadsheets). The Operating System is also *an interface between the application software and computer*. Without the operating system, the application programs would be unable to communicate with the computer.
- **Utility programs** are small, powerful programs with a limited capability, they are usually operated by the user to maintain a smooth running of the computer system. Various examples include file management, diagnosing problems and finding out information about the computer etc. Notable examples of utility programs include copy, paste, delete, file searching, disk defragmenter, disk cleanup. However, there are also other types that can be separately installable from the Operating System.
- **Library programs** are a compiled collection of subroutines
- **Translator software** (Compiler, Assembler, Interpreter)

- What is an operating system? Why it is necessary for computer system?
An **operating system (OS)** is a collection of software that manages [computer hardware](#) resources and provides common [services](#) for [computer programs](#). The operating system is an essential component of the [system software](#) in a computer system. Application programs usually require an operating system to function.

An operating system is a program designed to run other programs on a [computer](#). A computer's operating system is its most important program. It is considered the backbone of a computer, managing both software and hardware resources. Operating systems are responsible for everything from the control and allocation of memory to recognizing input from external devices and transmitting output to computer displays. They also

manage files on computer hard drives and control peripherals, like printers and scanners.

The operating system of a large computer system has even more work to do. Such operating systems monitor different programs and users, making sure everything runs smoothly, without interference, despite the fact that numerous devices and programs are used simultaneously. An operating system also has a vital role to play in security. Its job includes preventing unauthorized users from accessing the computer system.

OS does several things:

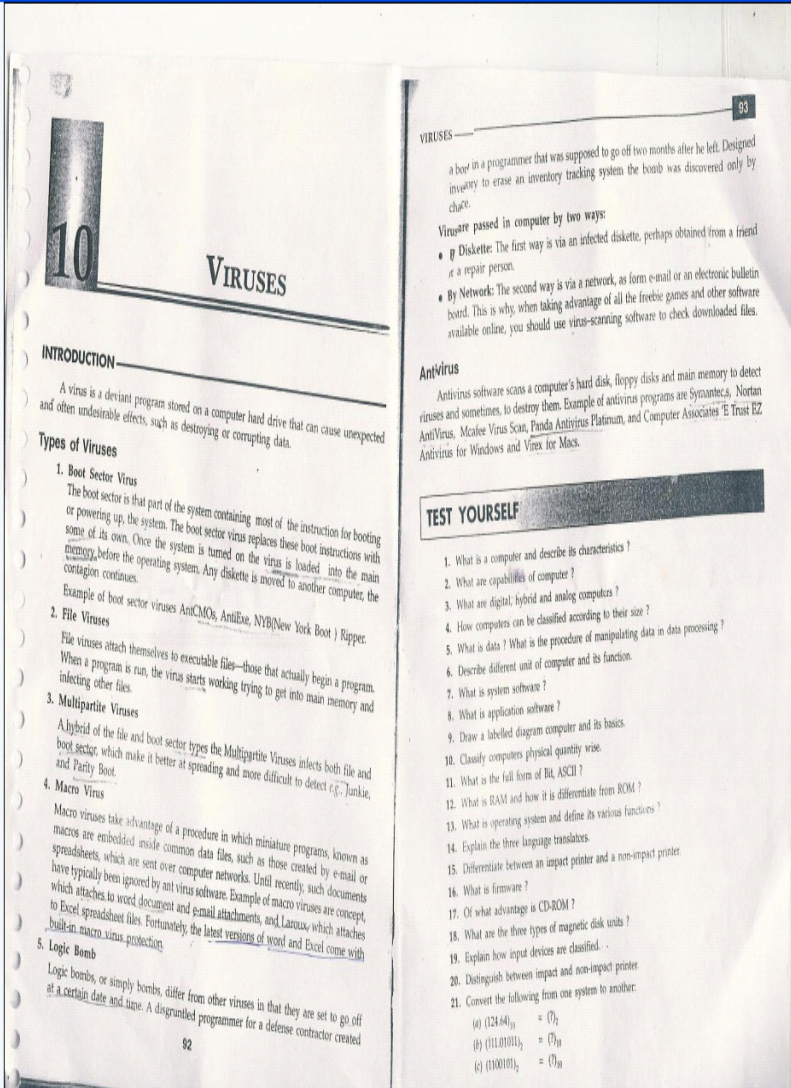
It runs tests to make sure everything is working correctly.

It checks for new hardware.

It then starts up the operating system.

Once the operating system has started up, it manages all of the software and hardware on the computer. Most of the time, there are many different programs running at the same time, and they all need to access your computer's Central Processing Unit (CPU), memory, and storage. The operating system coordinates all of this to make sure that each program gets what it needs. Without the operating system, the software wouldn't even be able to talk to the hardware, and the computer would be useless.

- What is a virus? Write the different categories of viruses and explain them.



10 VIRUSES

INTRODUCTION

A virus is a deviant program stored on a computer hard drive that can cause unexpected and often undesirable effects, such as destroying or corrupting data.

Types of Viruses

1. **Boot Sector Virus**
The boot sector is that part of the system containing most of the instruction for booting or powering up the system. The boot sector virus replaces these boot instructions with some of its own. Once the system is turned on the virus is loaded into the main memory, before the operating system. Any diskette is moved to another computer, the contagion continues.
Example of boot sector viruses: AmiCMOS, AmiEbx, NYB(New York Boot) Ripper.
2. **File Viruses**
File viruses attach themselves to executable files—those that actually begin a program. When a program is run, the virus starts working trying to get into main memory and infecting other files.
3. **Multipartite Viruses**
A hybrid of the file and boot sector types the Multipartite Viruses infects both file and boot sector, which make it better at spreading and more difficult to detect (e.g., Junkie).
4. **Macro Virus**
Macro viruses take advantage of a procedure in which miniature programs, known as macros are embedded inside common data files, such as those created by e-mail or spreadsheets, which are sent over computer networks. Until recently, such documents have typically been ignored by anti virus software. Example of macro viruses are concept, which attaches to word document and e-mail attachments, and Laroux, which attaches to Excel spreadsheet files. Fortunately, the latest versions of word and Excel come with built-in macro virus protection.
5. **Logic Bomb**
Logic bombs, or simply bombs, differ from other viruses in that they are set to go off at a certain date and time. A disgruntled programmer for a defense contractor created

VIRUSES

a bomb in a programmer that was supposed to go off two months after he left. Designed in 1971 to erase an inventory tracking system the bomb was discovered only by chance.

Viruses passed in computer by two ways:

- **Diskette:** The first way is via an infected diskette, perhaps obtained from a friend or a repair person.
- **By Network:** The second way is via a network, as form e-mail or an electronic bulletin board. This is why, when taking advantage of all the freebie games and other software available online, you should use virus-scanning software to check downloaded files.

AntiVirus

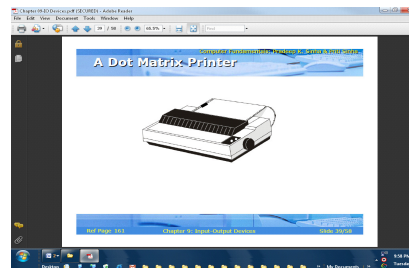
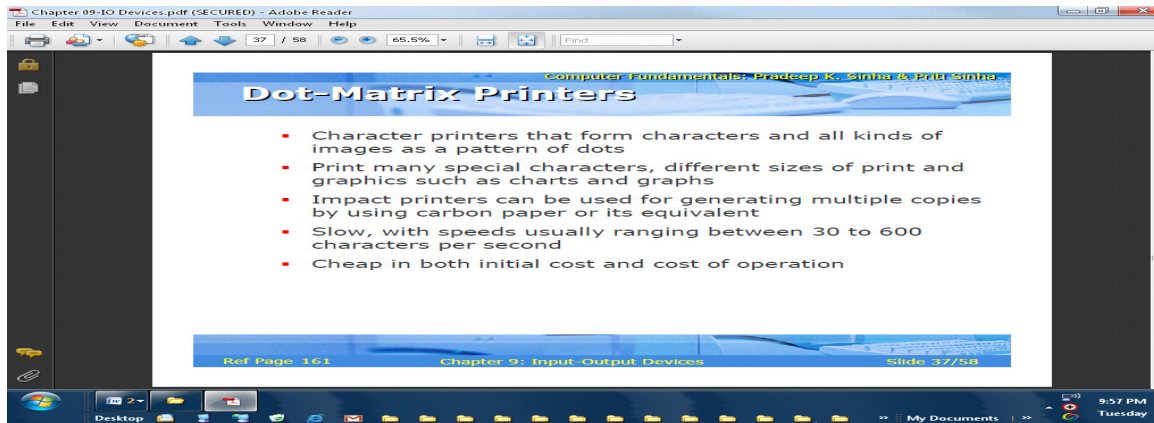
Antivirus software scans a computer's hard disk, floppy disks and main memory to detect viruses and sometimes, to destroy them. Example of antivirus programs are Symantec's, Norton AntiVirus, McAfee Virus Scan, Panda Antivirus Platinum, and Computer Associates' E Trust EZ Antivirus for Windows and Virex for Macs.

TEST YOURSELF

1. What is a computer and describe its characteristics?
2. What are capabilities of computer?
3. What are digital, hybrid and analog computers?
4. How computers can be classified according to their size?
5. What is data? What is the procedure of manipulating data in data processing?
6. Describe different unit of computer and its function.
7. What is system software?
8. What is application software?
9. Draw a labelled diagram computer and its basics.
10. Classify computers physical quantity wise.
11. What is the full form of BI, ASCII?
12. What is RAM and how it is differentiate from ROM?
13. What is operating system and define its various functions?
14. Explain the three language translators.
15. Differentiate between an impact printer and a non-impact printer.
16. What is firmware?
17. Of what advantage is CD-ROM?
18. What are the three types of magnetic disk units?
19. Explain how input devices are classified.
20. Distinguish between impact and non-impact printer.
21. Convert the following from one system to another.
 - (a) $(124.64)_{10} = (?)_2$
 - (b) $(111.01011)_2 = (?)_{10}$
 - (c) $(1100101)_2 = (?)_{10}$



- Write short note on:
 - Dot-matrix printers
 - Inkjet printers
 - Drum printers
 - Laser printers



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Inkjet Printers

- Character printers that form characters and all kinds of images by spraying small drops of ink on to the paper
- Print head contains up to 64 tiny nozzles that can be selectively heated up in a few micro seconds by an integrated circuit register
- To print a character, the printer selectively heats the appropriate set of nozzles as the print head moves horizontally
- Can print many special characters, different sizes of print, and graphics such as charts and graphs

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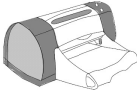
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An Inkjet Printers



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Drum Printers

- Line printers that print one line at a time
- Have a solid cylindrical drum with characters embossed on its surface in the form of circular bands
- Set of hammers mounted in front of the drum in such a manner that an inked ribbon and paper can be placed between the hammers and the drum
- Can only print a pre-defined set of characters in a pre-defined style that is embossed on the drum
- Impact printers and usually monochrome
- Typical speeds are in the range of 300 to 2000 lines per minute

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Printing Mechanism of a Drum Printer

Hammers (one for each band)

Paper Ribbon

Solid cylindrical drum with embossed characters

W W W W W W W W W W W W W W W W
 V V V V V V V V V V V V V V V V
 U U U U U U U U U U U U U U U U
 T T T T T T T T T T T T T T T T
 S S S S S S S S S S S S S S S S
 R R R R R R R R R R R R R R R R
 Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q
 P P P P P P P P P P P P P P P P
 O O O O O O O O O O O O O O O O
 N N N N N N N N N N N N N N N N

Total number of bands is equal to the maximum number of characters (print positions) on a line

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Laser Printers

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- Can print many special characters, different sizes of print, and graphics such as charts and graphs
- Are non-impact printers
- Most laser printers are monochrome, but color laser printers are also available
- Low speed laser printers can print 4 to 12 pages per minute. Very high-speed laser printers can print 500 to 1000 pages per minute
- More expensive than other printers

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A Laser Printers



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