1. (a) What is a computer system? Explain area of applications of computer system.
Ans: A computer system is a basic, complete and functional computer, including all the hardware and software required to make it functional for a user.
It should have the ability to receive user input, process data, and with the processed data, create information for storage and/or output.

Techopedia explains Computer System
A computer system allows users to input, manipulate and store data. Computer systems typically include a computer, monitor, keyboard, mouse and other optional components. All of these components also can be integrated into all-in-one units, such as laptop computers.

During the data processing stage, instruction sets, known as programs, are provided to let the system know what to do with the entered system data. Without these programs, the computer would not know how to process data that enters the system, and the data might be discarded. Known as a stored program computer, this type of computer is the most common in use today. It is very flexible, as it can process any task by loading a program from storage. Computer systems can work by themselves or access other devices that are external or connected with other computer systems.

The five major areas of application computer systems are:

Education: Getting the right kind of information is a major challenge as is getting information to make sense. College students spend an average of 5-6 hours a week on the Internet. Research shows that computers can significantly enhance performance in learning. Students exposed to the internet say they think the web has helped them improve the quality of their academic research and of their written work. One revolution in education is the advent of distance learning. This offers a variety of internet and video-based online courses.

Health and Medicine: Computer technology is radically changing the tools of medicine. All medical information can now be digitized. Software is now available to computer the risk of a disease. Mental health researchers are using computers to screen troubled teenagers in need of psychotherapy. A patient paralyzed by a stroke has received an implant that allows communication between his brain and a computer; as a result, he can move a cursor across a screen by brainpower and convey simple messages.

Science: Scientists have long been users of it. A new adventure among scientists is the idea of a “collaboratory”, an internet based collaborative laboratory, in which researchers all over the world can work easily together even at a distance. An example is space physics where space physicists are allowed-to-band together to measure the earth’s ionosphere from instruments on four parts of the world.

Business: Business clearly see the interest as a way to enhance productivity and competitiveness. Some areas of business that are undergoing rapid changes are sales and marketing, retailing, banking, stock trading, etc. Sales representatives not only need to be better educated and more knowledgeable about their customer’s businesses, but also must be comfortable with computer technology. The Internet has become a popular marketing tool. The world of cyber cash has come to banking not only smart cards but Internet banking, electronic deposit, bill paying, online stock and bond trading, etc.

Recreation and Entertainment: Our entertainment and pleasure time have also been affected by computerization. For example:
- In movies, computer generated graphics give freedom to designers so that special effects and even imaginary characters can play a part in making movies, videos, and commercials.
- In sports, computers compile statistics, sell tickets, create training programs and diets for athletes, and suggest game plan strategies based on the competitor’s past performance.
- In restaurants, almost every one has eaten-food where the clerk enters an order by indicating choices on a rather unusual looking cash register; the device directly enters the actual data into a computer, and calculates the cost and then prints a receipt.

(b) Explain different types of main memory briefly.
Ans: Main memory can be classified into RAM and ROM.

RAM can be further classified as DRAM and SRAM: RAM is a semiconductor based computer memory that stores program code and data. As the primary working memory of a computer, RAM stores program code and data that can be accessed, read, and written to by the Central Processing Unit (CPU) and other hardware devices. RAM is characterized as read/write memory to distinguish it from ROM (Read Only Memory), which is the primary storage memory. RAM is volatile, meaning that any data stored in RAM is lost and unrecoverable if power is lost. Many programs set aside some amount of RAM as a temporary work space for data until it can be printed, transmitted, or stored on a hard drive, floppy disk, or other permanent or semi-permanent medium.

Static RAM: SRAM can store data for a longer time than the DRAM. It can hold the data and information till the power supply is on. These consume more power and are costly. SRAM has a higher speed as compared to DRAM. It is used in cache memory for being faster.

Dynamic RAM: DRAM Dynamic RAM loses its stored content in shorter time than the SRAM. It can hold for only a few milliseconds. These are cheaper as compared to SRAM.

The following are commonly used RAM chips:
- EDO (Extended Data Output RAM)
- SDRAM (Synchronous DRAM)
- SGRAM (Synchronous Graphics RAM), and
- Dual-Ported DRAM.

ROM can be classified in PROM and EPROM: Semiconductor based computer memory that stores program code that the Central Processing Unit (CPU) can read, but not write to, i.e., change or modify in any way. This is why it is called read only memory. Programs are stored in ROM on semiconductor chips, during the manufacturing process. Such programs are said to be hard coded to distinguish them from software. The term read only memory distinguishes it from Random Access Memory (RAM), which also is stored on semiconductors, but it is read/write memory.

Unlike RAM, ROM is not volatile, i.e., the programs are not lost when the electric power is lost or turned off. Therefore, programs required during system start-up commonly are stored in ROM.

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