Computer Fundamentals

Set-2:

1. Draw and Discuss the date read-write mechanism of 64x6 RAM. (3.5)
2. Define: Computer memory, suppose your computer has 2MB cache, 4GB RAM and 500GB Hard Drive. Explain your idea behind having 3 different types of memory instead of having just one. (3)
3. Why Ram called primary memory and volatile memory? (2)
4. Draw the architecture of a 64x4 RAM and discuss data read-write mechanism. (4)
5. What is Bios and Flash Memory? (1.75)
6. Describe two main parts of the CPU and explain how they work together. (4)
7. Difference between RAM and ROM. (2)
8. Describe three hardware factors that affect processing speed. (2.75)
9. What is cache memory? Discuss why is it essential in a computer system? (3.75)
10. Define: Resolution and refers rate to a monitor with example. (2)

SET-2

3. Why Ram called primary memory and volatile memory? (2)

Answer: RAM is called 'volatile' memory by analogy because if the computer loses power, all the data stored in RAM (or other volatile memory) is lost or 'evaporates'. Non-volatile memory is memory that keeps its data while the system isn't running.

5. What is Bios and Flash Memory? (1.75)

Answer:

Bios: BIOS software is stored on a non-volatile ROM chip on the motherboard. In modern computer systems, the BIOS contents are stored on a flash memory chip so that the contents can be rewritten without removing the chip from the motherboard.

Flash Memory: Flash memory is electronic (solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed.

6. Describe two main parts of the CPU and explain how they work together. (4)

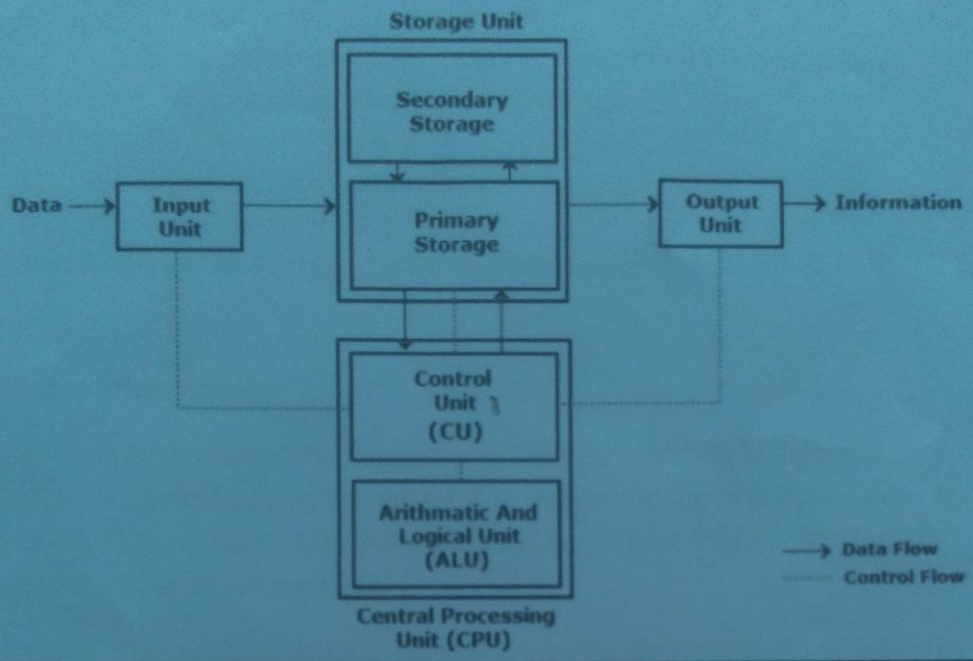
Answer:

program control unit:

The control unit (CU) is a component of a computer's central processing unit (CPU) that directs the operation of the processor. It tells the computer's memory, arithmetic/logic unit and input and output devices how to respond to a program's instructions.

It directs the operation of the other units by providing timing and control signals. Most computer resources are managed by the CU. It directs the flow of data between the CPU and the other devices. John von Neumann included the control unit as part of the von Neumann architecture. In modern computer designs, the control unit is typically an internal part of the CPU with its overall role and operation unchanged since its introduction.

Block diagram of computer



ALU:

An arithmetic logic unit (ALU) is a digital circuit used to perform arithmetic and logic operations. It represents the fundamental building block of the central processing unit (CPU) of a computer. Modern CPUs contain very powerful and complex ALUs.

7. Difference between RAM and ROM. (2)

Answer: There are some difference between RAM and ROM which are given below:

RAM:

i. When the power supply of a computer system is turn off or reset, then the data or information is loss.
ii. It is used for temporarily.

iii. It has the limited storage capacity.
iv. It is very expensive in cost.

ROM:

i. When the power supply of a computer system is turn off or reset, then the data or information does not loss.
ii. It is used for permanently.
iii. It has the large storage capacity.
iv. It is very cheaper in cast.

8. Describe three hardware factors that affect processing speed. (2.75)

Answer:

Registers Affect Speed:

A register is a high-speed memory area on the CPU, which hold data and instructions currently being processed. The registers in the first PCs could hold two bytes--16 bits--each. Most CPUs sold today, for both PCs and Macintosh computers, have 64-bit registers.

The size of the registers, which is sometimes called the word size, indicates the amount of data with which the computer can work at any given time. The bigger the word size, the more quickly the computer can process a set of data. Occasionally, you will hear people refer to "32-bit processors," or "64-bit processors," or even "64-bit computers." This terminology refers to the size of the registers in the processor. If all other factors are kept equal, a CPU with 32-bit registers can process data twice as fast as one with 16-bit registers

Memory and Computing Power:

The amount of RAM in a computer can have a profound effect on the computer's power. More RAM means the computer can use bigger, more powerful programs, and those programs can access bigger data files.

More RAM also can make the computer run faster. The computer does not necessarily have to load an entire program into memory to run it. However, the greater the amount of the program that fits into memory, the faster the

program runs. For example, a PC with 16 MB of RAM is able to run Microsoft Windows 98, even though the program actually occupies about 195 MB of disk storage space. When you run Windows, the program does not need to load all its files into memory to run properly. It loads only the most essential parts into memory. When the computer needs access to other parts of the program on the disk, it can unload, or swap out, nonessential parts from RAM to the hard disk. Then the computer can load, or swap in, the program code or data it needs. This process is called swapping. While this is an effective method for managing a limited amount of memory, it can result in slow system performance because the CPU, memory, and disk are continuously occupied with the swapping process. If your PC has 64 MB of RAM (or more), you will notice a dramatic difference in how fast Microsoft Windows 98 runs because the CPU will need to swap program instructions between RAM and the hard disk much less often.

The Data Bus

The data bus is an electrical path that connects the CPU, memory, and the other hardware devices on the motherboard. Actually, the bus is a group of parallel wires. The number of wires in the bus affects the speed at which data can travel between hardware components, just as the number of lanes on a highway affects how long it takes people to reach their destinations. Because each wire can transfer 1 bit of data at a time, an 8-wire bus can move 8 bits at a time, which is a full byte. A 16-bit bus can transfer 2 bytes, and a 32-bit bus can transfer 4 bytes at a time. Newer model computers have a 64-bit data bus, which transfers 8 bytes at a time.

9. What is cache memory? Discuss why is it essential in a computer system?

Answer:

Cache:

Moving data between RAM and the CPU's registers is one of the most time-

consuming operations a CPU must perform, simply because RAM is much slower than the CPU. A partial solution to this problem is to include cache memory. Cache (pronounced cash) memory is extremely fast memory, which hold the most recently used data and instructions.

When a program is running and the CPU needs to read data or program instructions from RAM, the CPU checks first to see whether the data is in cache memory. If the data is not there, the CPU reads the data from RAM into its registers, but it also loads a copy of the data into cache memory. The next time the CPU needs that same data, it finds it in the cache memory and saves the time needed to load the data from RAM.

10. Define: Resolution and refers rate to a monitor with example. (2)

Answer:

Resolution: The number of pixels scattered on monitor at a particular moment. It is considered in row by column that is matrix form. It is changeable.
Example: 600X480, 800X600, 1024X768 etc.

Refresh Rate: The number of times the electron beam scans (strikes on pixels) the entire monitor per second is called refresh rate. It is measured in hertz (cycle/sec.) and it has a range 45 Hz to 72 Hz. A 60 Hz refresh rate is standard. A lower refresh rate makes picture flickering and higher makes harm for phosphor coating.