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COMPUTER APPLICATIONS

3. COMPUTER ORGANIZATION

SECTION – A

Choose the correct answer:

1. Which of the following is said to be the brain of a computer?

(a) Input devices (b) Output devices (c) Memory device (d) **Microprocessor**

2. Which of the following is not the part of a microprocessor unit?

(a) ALU (b) Control unit (c) **Cache memory** (d) register

3. How many bits constitute a word?

(a) 8 (b) 16 (c) 32 (d) **Determined by the processor used.**

4. Which of the following device identifies the location when address is placed in thememory address register?

(a) Locator (b) Encoder (c) **Decoder** (d) Multiplexer

5. Which of the following is a CISC processor?

(a) Intel P6 (b) AMD K6 (c) **Pentium III** (d) Pentium IV

6. Which is the fastest memory?

(a) Hard disk (b) Main memory (c) **Cache memory** (d) Blue-Ray dist

7. How many memory locations are identified by a processor with 8 bits address busat a time?

(a) 28 (b) 1024 (c) **256** (d) 8000

8. What is the capacity of 12cm diameter DVD with single sided and single layer?

(a) **4.7 GB** (b) 5.5 GB (c) 7.8GB (d) 2.2 GB

9. What is the smallest size of data represented in a CD?

(a) Blocks (b) Sectors (c) **Pits** (d) Tracks

10. Display devices are connected to the computer through.

(a) USB port (b) Ps/2 port (c) SCSI port (d) **VGA connector**

SECTION-B

Short Answers

1. What are the parameters which influence the characteristics of a microprocessor?

A Microprocessor's performance depends on the following characteristics:

* Clock speed * Instruction set * Word size

2. What is an instruction?

A command which is given to a computer to perform an operation on data is called an instruction.

3. What is a program counter?

The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

4. What is HDMI?

High-Definition MultimediaInterface is an audio/video interfacewhich transfers the uncompressed videoand audio data from a video controller,to a compatible computer monitor, LCDprojector, digital television etc.

5. Which source is used to erase the content of a EPROM?

Ultraviolet rays is used to erase the content of a EPROM.

SECTION-C

Explain in Brief

1. Differentiate Computer Organization from Computer Architecture.

Computer organization	**Computer Architecture**
Computer organization deals with the hardware components of a computer system. It includes Input / Output devices, the Central Processing Unit, storage devices and primary memory.	Computer Architecture also deals with how they are interconnected to implement an architectural specification.
Computer Organization deals with the hardware components that are transparentto the programmer.	Computer architecture deals with the engineering considerations involved in designing a computer.

2. Classify the microprocessor based on the size of the data.

Depending on the data width, microprocessors can process instructions. The microprocessors can be classified as follows:

* 8-bit microprocessor

*16-bit microprocessor

* 32-bit microprocessor

* 64-bit microprocessor

3. Write down the classifications of microprocessors based on the instruction set.

RISC stands for Reduced Instruction Set Computers. They have asmall set of highly optimized instructions.Complex instructions are alsoimplemented using simple instructions,thus reducing the size of the instruction set.

Example: RISC processors are Pentium IV, Intel P6, AMD K6 and K7.

CISC stands for Complex Instruction Set Computers. They supporthundreds of instructions. Computerssupporting CISC can accomplish a widevariety of tasks, making them ideal forpersonal computers.

Example: CISC processors are Intel 386& 486, Pentium, Pentium II and III, and Motorola 68000.

4. Differentiate PROM and EPROM.

PROM	EPROM
Programmable read only memory is also a non-volatile memory	Erasable Programmable Read Only Memory is a special type of memory
PROMs retain their contents even when the computer is turned off.	EPROM retains its contents until it is exposed to ultraviolet light.
PROM can be written only once and cannot be erased.	Ultraviolet rays is used to erase the content of a EPROM

5. Write down the interfaces and ports available in a computer.

Serial Port: To connect the external devices, found in old computers.

Parallel Port: To connect the printers, found in old computers.

USB Ports: To connect external devices like cameras, scanners, mobile phones, external hard disks and printers to the computer.

VGA Connector: To connect a monitor or any display device like LCD projector.

Audio Plugs: To connect sound speakers,microphone and headphones.

PS/2 Port: To connect mouse and keyboard to PC.

SCSI Port: To connect the hard disk drives and network connectors.

6. Differentiate CD and DVD

CD	DVD
CD stands for Compact Disk	DVD stands for Digital Versatile Disc
CD data is represented as tiny indentations known as "pits"	DVD-ROM can be visually determined by noting the number of data sides of the disc
The capacity of an ordinary CD-ROM is 700MB.	The capacity of DVD is 4.7 GB
A CD is made from 1.2 millimeters thick, polycarbonate plastic material.	A DVD is made from 12 cm diameter disc with single sided,single layer has 4.7 GB capacity

7. How will you differentiate a flash memory and an EEPROM?

Flash Memory	EEPROM
Flash memory is an electronic (solid-state) non-volatile computer storage	Electrically Erasable Programmable Read Only Memory is a special type of PROM
Flash memory offers fast access times.	EEPROM is slower in performance.
It can be erased by exposing it to an electrical charge.	It can be electrically erased and reprogrammed.

SECTION - D

Explain in detail

1. Explain the characteristics of a microprocessor.

A Microprocessor's performance depends on the following characteristics:

* Clock speed * Instruction set * Word size

Clock speed

Every microprocessor has an internal clock that regulates the speed at which it executes instructions. The speed at which the microprocessor executes instructions is called the clock speed. Clock speed is measured in MHz (Mega Hertz) or in GHz (Giga Hertz).

Instruction Set

A command which is given to a computer to perform an operation on data is called an instruction. Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set. This instruction set carries out the following types of operations:

* Data transfer
* Arithmetic operations
* Logical operations
* Control flow
* Input/output

Word Size

• The number of bits that can be processed by a processor in a single instruction is called its word size. Word sizedetermines the amount of RAM that canbe accessed by a microprocessor at one time and the total number of pins on the microprocessor. Total number of input and output pins in turn determines the architecture of the microprocessor.

2. How the read and write operations are performed by a processor? Explain.

The read operation fetches data from memory and transfers to MDR. A single control line performs two operations like Read/Write using 1or 0. Also, the write operation transfers data from the MDR to memory.

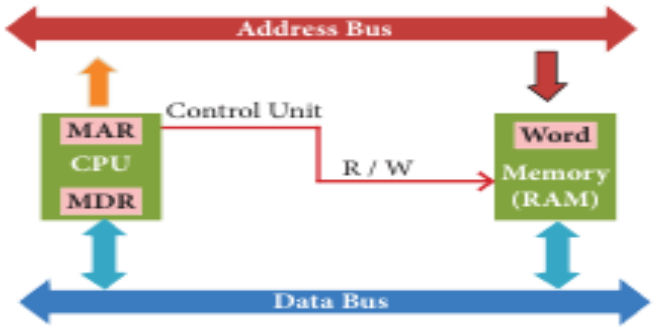

Figure 3.3 Bus connectivity between CPU and Memory

The word in the RAM has the same size (no. of bits) as the Memory DataRegister (MDR). If the processor is an 8-bit processor like Intel 8085, its MDR and the word in the RAM both have 8 bits.If the size of the MDR is eight bits, which can be connected with a word in the memory which is also eight bits size.The data bus has eight parallel wires to transfer data either from MDR to word or word to MDR based on the control(Read or write). This control line is labeled as R/W , which becomes 1 means READ operation and 0 means WRITE operation.

Figure 3.4 Before the read operation

Figure 3.5 After the read operation

The content of MDR and the word before the READ operation.Also, the content of MDR and the word after the READ operation.The read operation transfers the data(bits) from word to memory data register. The write operation transfers the data(bits) from memory data register to word.

3. Arrange the memory devices in ascending order based on the access time.

Blu-Ray Disc

Blu-Ray Disc is a high-density optical disc similar to DVD. Blu-ray is the type of disc used for PlayStation games and for playing High-Definition (HD) movies. A double-layer Blu-Ray disc can store up to 50GB (gigabytes) of data.

This is more than 5 times the capacity of a DVD, and above 70 times of a CD. The format was developed to enable recording, rewriting and playback of high-definition video, as well as storing large amount of data.

Hard Disks

Hard disk is a magnetic disk on which you can store data. The hard disk has the stacked arrangement of disks accessed by a pair of heads for each of the disks. The hard disks come with a single or double sided disk.Hence, it is called as Blu-Ray.

Random-Access Memory (RAM)

The main memory is otherwise called as Random Access Memory. This is available in computers in the form of Integrated Circuits (ICs). It is the place in a computer where the Operating System,

Application Programs and the data in current use are kept temporarily so that they can be accessed by the computer's processor.The smallest unit of information that can be stored in the memory is called as a bit. The memory can be accessed by a collection of 8 bits which is called as a byte.

Cache Memory

The cache memory is a very high speed and expensive memory, which is used to speed up the memory retrieval process. Due to its higher cost, the CPU comes with a smaller size of cache memory compared with the size of the main memory. Without cache memory, every time the CPU requests the data, it has to be fetched from the main memory which will consume more time.

The idea of introducing a cache is that, this extremely fast memory would store data that is frequently accessed and if possible, the data that is closer to it. This helps to achieve the fast response time, Whereresponse Time, (Access Time) refers to how quickly the memory can respond to a read / write request. The arrangement of cache memory between the CPU and the main memory.

4. Explain the types of ROM.

Read Only Memory (ROM)

Read only memory refers to special memory in a computer with pre-recorded data at manufacturing time which cannot be modified. The stored programs that start the computer and perform diagnostics are available in ROMs.

Programmable Read Only Memory (PROM)

Programmable read only memory is also a non-volatile memory on which data can be written only once. Once aprogram has been written onto a PROM, it remains there forever. Unlike the main memory, PROMs retain their contents even when the computer is turned off.

The PROM differs from ROM. PROM is manufactured as a blank memory, whereas a ROM is programmed during the manufacturing process itself. PROM programmer or a PROM burner is used to write data to a PROM chip. The process of programming a PROM is called burning the PROM.

Erasable Programmable ReadOnly Memory (EPROM)

Erasable Programmable Read Only Memory is a special type of memory which serves as a PROM, but the content can be erased using ultraviolet rays. EPROM retains its contents until it is exposed to ultraviolet light. The ultraviolet light clears its contents, making it possible to reprogram the memory.

An EPROM differs from a PROM,PROM can be written only once and cannot be erased. EPROMs are used widely in personal computers because they enable the manufacturer to change the contents of the PROM to replace with updated versions or erase the contents before the computer is delivered.

Electrically Erasable Programmable Read Only Memory (EEPROM)

Electrically Erasable Programmable Read Only Memory is a special type of PROM that can be erased by exposing it to an electrical charge. Like other types of PROM, EEPROM retains its contents even when the power is turned off. Comparing with all other types of ROM, EEPROM is slower in performance.