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Top 21 Computer Architecture Interview Questions & Answers

1) Explain what is Computer Architecture?

Computer architecture is a specification detailing about how a set of software and hardware standards interacts with each other to form a computer system or platform.

2) How Computer Architecture is characterized?

The computer architecture is characterized into three categories

- **System Design:** It includes all the hardware component in the system, including data processor aside from the CPU like direct memory access and graphic processing unit
- **Instruction Set Architecture (ISA):** It is the embedded programming language of the central processing unit. It determines the CPU's functions and capabilities based on programming it can process.
- **Microarchitecture:** It defines the data path, storage element, and data processing as well as how they should be implemented in the ISA.

3) Mention important steps for computer design?

A CPU architecture is defined by the set of machine language which can be defined as a

- Set of registers and their functions (capabilities)
- Sequence of micro-operations performed on the data stored in registers
- Control signals that initiate the sequence

4) Mention what are the different types of fields that are part of an instruction?

The different types of fields that are parts of an instruction are

- Operation Code Field or OP Code field: This field is used to determine the operation to be performed for the instruction
- Address Field: This field is used to determine various addresses such as memory address and register address
- Mode Field: This field determines how operand is to perform or how effective address is derived

5) Mention what are the basic components of a Microprocessor?

The basic components of a Microprocessor are

- Address lines to refer to the address of a block
- Data lines for data transfer
- IC chips for processing data



6) Mention what are different types of interrupts in a microprocessor system? Explain?

There are three types of interrupts that can cause a break.

- **External Interrupts:**

From external input/output devices such types of interrupt comes.

- **Internal Interrupts:**

These types of interrupts are caused due to any exception caused by the program itself. For example, division by zero or an invalid opcode, etc.

- **Software Interrupts:**

Only during the execution of an instruction such type of interruption can occur. The primary purpose of such interrupts is to switch from user mode to supervisor mode.

7) Mention what are the common components of a microprocessor are?

The common components of a microprocessor include

- I/O Units
- Control Unit
- Arithmetic Logic Unit (ALU)
- Registers
- Cache

8) Explain what is Snooping Cache?

Snooping Cache is the process where individual caches monitor address lines for accesses to memory locations that they have cached.

9) Mention what is the simplest way to determine cache locations in which to store memory blocks?

Direct Mapping is the simplest way to define cache locations in which to store memory blocks. Associative memories are expensive in comparison to random-access memories due to the added logic associated with each cell.

10) What digital functions should be used to convert the octal code to binary code?

To convert the octal code to binary code multiplexers is used. It is also referred as Data Selector, where dynamic memory uses the same address lines for both row and column.

11) What technique is used to automatically move program and data blocks into the physical main memory when they are required for execution?

Virtual Memory technique is used. It provides a mechanism for translating program generated address into correct main memory locations. By means of mapping table translation or mapping is handled.

12) Mention what is the use of RAID system?

The use of RAID system is to increase the disk storage capacity and availability.

13) Explain what type of memory that can be erased with the electric discharge?

With the passage of electric discharge, EEPROM is the type of memory whose content is erased.

14) Explain what is horizontal micro code?

The horizontal micro code contains the control signal without any intermediary. It contains a lot of signals and hence due to that the number of bits also increases.

15) Explain what is direct mapping?

In direct mapping, the RAM is used to store data and some of the data is stored in the Cache. The address space is divided into two parts index field and tag field. The tag field is used to store the tag field whereas the rest is stored in the main memory.

16) Mention what are the types of micro-operations?

The types of micro-operations are

- **Register transfer micro-operations:** These type of micro-operations are used to transfer information from one register to another binary information
- **Shift micro-operation:** These operations are used to perform shift operations in data store in registers
- **Logic micro-operation:** These are used to perform on numeric data stored in the registers some arithmetic operations
- **Arithmetic micro-operations:** These micro-operations are used to execute some arithmetic operations on numeric data stored in the registers

17) What does DMA stands for?

DMA stands for Direct Memory Access.

18) When large number of registers are included in the CPU, what is the most efficient way to connect them?

When large number of registers are included in the CPU, the most efficient way to connect them is through an ALU.

19) Explain if the internal bus connects only register within the CPU, how would you get data to and from memory?

The AR or Address Register is used to select a memory address, and the Data Register is used to send and receive the data. Both these register are connected to the internal BUS, and the Data Register acts as a bridge between the memory data BUS and internal BUS.

So first we load AR with the desired memory address and then transfer to or from Data Register.

20) Explain what is WAIT state?

A WAIT state plays a key role in preventing CPU speed incompatibilities. Many times the processor is at ready state to accept data from a device or location, but there might be no input available. In such case there will be wastage of CPU time, and the system gets into WAIT state.

21) Explain how you can deal with WAIT state?

The one way to deal with WAIT state is increasing the microprocessor clock period by reducing the clock frequency

The second way is by using special control input READY. It allows the memory to set its own memory cycle time.