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Subject :   MICROPROCESSOR

Chapter # 4

Addressing Modes

Short questions

Name 5 different addressing modes?
Immediate, Direct, Register, Register indirect, Implied addressing modes

What is Stack Pointer?
Stack pointer is a special purpose 16-bit register in the Microprocessor, which holds the address of the top of the stack.

Which processor structure is pipelined?
All x86 processors have pipelined structure.

Course outline questions

Describe Data Addressing Modes?
Variations in the way instructions are used. There are 8 different data addressing modes

- Register addressing modes
- Immediate addressing modes
- Direct addressing modes
- Register addressing modes
- Base- plus- index addressing modes
- Register relative addressing modes
- Base relative plus addressing modes
- Scaled index addressing modes

Q: Explain the operation of Register addressing mode?

In this addressing mode, the source of data or destination of result is register. In this type of addressing mode the name of register is given in the instruction where the data to be read or result to be stored. Example: ADD A, R5 (the instruction will do the addition of data in accumulator with data in register R5).

Q: Explain the operation of Immediate Addressing Modes?

In immediate addressing mode, the data immediately follows the instruction. This means the data to be used is already given in the instruction itself. Example: MOV A, #25H (this instruction will move the data 25H to accumulator. The # sign shows that preceding term is data not the address.)

Q: Explain the operation of Direct Addressing Modes?

In this type of addressing mode, the address of data to be read is directly given in the instruction. In case for storing result the address given in instruction is used to store the result. Example: MOV A, 46H (this instruction will move the content of memory location 46H to accumulator)

Q: Explain the operation of Base-Plus-Index Addressing?

Base-plus-index addressing is similar to indirect addressing because it indirectly addresses memory data, this type of addressing uses one base register (BP or BX), and one index register (DI or SI) to indirectly address memory.

Q: Explain the operation of Register Relative Addressing?

Register relative addressing is similar to base-plus-index addressing and displacement addressing. In register relative addressing, the data in a segment of memory are addressed by adding the displacement to the contents of a base or an index register (BP, BX, DI, or SI).

Q: Explain the operation of Base Relative-Plus-Index Addressing?

The base relative-plus-index addressing mode is similar to the base-plus-index addressing mode. But it adds a displacement, besides using a base register and an index register, to form the memory address. This type of addressing mode often addresses a two-dimensional array of memory data.

Q: Explain the operation of Program Memory addressing Modes?

Program memory-addressing modes, used with the JMP and CALL instructions, consist of three distinct forms: direct, relative, and indirect. This section introduces these three addressing forms, using the JMP instruction to illustrate their operation.

Q: Explain the operation of Stack Memory-Addressing Modes?

The stack plays an important role in all microprocessors. It holds data temporarily and stores return addresses for procedures. The stack memory is a LIFO (last-in, first-out) memory, Data are placed onto the stack with a PUSH instruction and removed with a POP instruction.

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