

Name: KEY

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COE 205, Term 052
Computer Organization & Assembly Programming
Quiz# 1

Date: Wednesday, Feb. 22, 2006

Q1. Explain the function of each of the following registers

i. Instruction Pointer (IP).

A register that holds that address of the next instruction to be fetched from memory.

ii. Instruction Register (IR).

A register that holds that instruction fetched from memory.

Q2. Suppose that the Instruction Pointer (IP) content is 0005 and that the instruction stored starting at that address is MOV AX, 5, which has a corresponding machine code B80005. Determine the content of the Instruction Pointer (IP) after fetching this instruction.

Since the size of the fetched instruction is 3 bytes, then the IP will be incremented by 3 to point to the address of the next instruction i.e., $IP=0005+3=0008$.

Q3. Give two advantages of programming in assembly language compared to high-level languages (e.g. Java).

1. One can write more efficient programs with smaller code size than those written in high-level languages and translated into assembly by compilers.
2. Full control of machine resources.

Q4. Which of the following 8086 registers is part of the ISA: **Instruction Pointer (IP), Instruction Register (IR), Memory Address Register (MAR), Memory Data Register (MDR), AX, DL, SI, SP, BP, Y, Z.**

The following registers are part of the ISA:

Instruction Pointer (IP), AX, DL, SI, SP, BP.

Q5. Determine the machine type and the size of the address bus and the data bus for the **8086** and the **Pentium IV** processors.

Processor	Machine Type	Address Bus	Data Bus
8086	16-bit	20-bit	16-bit
Pentium IV	32-bit	36-bit	64-bit

Q6. Determine whether the following operations are performed in the fetch or execute phase: **Reading an instruction from Memory, Reading and Writing Operands from/to Memory, Incrementing the Program Counter, Performing Arithmetic Operations e.g. subtraction.**

Operation	Phase
Reading an instruction from Memory	Fetch
Reading and Writing Operands from/to Memory	Execute
Incrementing the Program Counter	Fetch
Performing Arithmetic Operations e.g. subtraction	Execute

Q7. Order the following storage devices once in terms of **speed** and once in terms of **capacity**: RAM, Registers, Hard Disk, and Cache.

SPEED: Registers, Cache, RAM Hard Disk (order from highest speed to lower)

CAPACITY: Hard Disk, RAM, Cache, Registers (order from higher capacity to lower)