COE 205, Term 031
Computer Organization & Assembly Programming
Quiz# 1 (07/10/03)

Student Name: Key Solution **ID:** **Section:** 03

Question 1: Explain the function of each of the following:

i. Assembler

The Assembler is a program that translates from assembly language to machine language.

ii. Instruction Pointer (IP).

The Instruction Pointer is a register that holds the address of the next instruction to be fetched from memory.

iii. Instruction Register (IR).

The Instruction Register is a register that is used to store temporarily the fetchedinstruction for execution.

Question 2: Name all registers of the 8086 processor. Arrange the registers in groups.

AX	**BP**	**SI**	**DS**	**FLAG REGISTER**
BX	**SP**	**DI**	**CS**	
CX			**ES**	
DX			**SS**	**IP**

Question 3: Determine the machine type and the size of the address and the data buses for the 8086 processor.

- 16 bit processor
- 16 bit data register and 20 bit address bus

Question 4: Determine whether the following operations are performed in the fetch or execute phase:

Instruction	Phase
Reading an instruction from Memory	**Fetch**
Reading Operands from Memory	**Execute**
Decoding an Instruction	**Execute**
Incrementing the Instruction Pointer.	**Fetch**

Question 5: Order the following storage devices in terms of speed from fastest to slowest: Cache, RAM, Tape, Registers.

Registers, Cache, RAM, Tape

Question 6: Given two numbers A = 7FH and B = 3, assuming that they are represented as 8-bit 2's complement numbers. Perform the following arithmetic operation and indicate whether an *overflow* occurs: A + B

0111 1111
+ 11
1000 0010

➔ **Result will be interpreted as a negative number hence overflow**

Question 7: Given the binary number 11100010 represented in an 8-bit format. Determine all possible values that this number can represent.

11100010 ➔ E2h

226_{10}

- 30_{10} (MSB = 1 expressed in 2's complement)

- 62h (MSB = 1 expressed in signed magnitude)

'•' ASCII Character

Question 8: Given the following declaration in the data segment**:**

```
.data
    A    DB    34H
    B    DW    ?
    M    EQU   234H
    C    DW    'AB'
```

Show how these values would be represented in memory, if we suppose that data is put in memory starting from address: 2000 H

Address	Content
1FFF	..
2000	34
2001	?
2002	?
2003	41
2004	42
2005	..