Benha University **Faculty of Engineering (at Shoubra)** **Electrical Engineering Department**		**MidTerm Exam** (Total Mark: 25) **Subject:** Microprocessors **Date:** Sat 12/11/2016 **Duration:** 1 Hour

Name:..... 3rd / 4th year B.N : .... Score : .....

1. (10 points) Identify the choice that best completes the statement or answers the question.

(1) If ES = D321H, then the range of physical addresses for the extra segment is:

A. 00000H – 0D321H
C. D3210H – E320FH
B. D3210H – D321FH
D. 0D321H - 1D320H

(2) What is the largest signed integer that may be stored in 32 bits?

A. $2^{32}-1$ **B.** $2^{31}-1$ C. 2^{32} D. 2^{31}

(3) The ———— allows the program to single step (execute one instruction at a time).

A. Carry Flag B. Direction Flag **C. Trap Flag** D. Parity Flag

(4) Why you use Memory Segmentation in 8086 Microprocessor?

A. allow the processor to access 64kb of memory
B. allow the processor to access more than 64kb of memory
C. None of the above

(5) What will be the contents of register AL after the following has been executed
MOV BL, 8C
MOV AL, 7E
ADD AL, BL

A. 0A and carry flag is set
C. 0A and carry flag is reset
B. 6A and carry flag is set
D. 6A and carry flag is reset

(6) Data transfer instructions will.

A. Affect flag register
C. Use RSI and RDI registers
B. Not affect flag register
D. Non of the above

(7) Which mode does Windows use?

A. Real mode **B. Protected mode** C. Flat mode D. None of the above

(8) If CS = 7FA2H, SS = 0801H, SI = 0100H and IP = 438EH the address of the next instruction is:

A. 83DAEH B. 438EH C. 83DA0H D. 438FH

(9) In protected mode memory addressing segment registers used as

A. A selector to global descriptor table
B. A selector to local descriptor table
C. A segment register for real mode segments
D. A selector to either local or global descriptor table

(10) What type of circuit is used to provides signal protection and amplification

A. Decoder B. Latch **C. Buffer** D. Register

(11) The basic parts of an instruction, in order from left to right, are:

A. comment, label, mnemonic, operand(s)
C. label, mnemonic, comment
B. label, mnemonic, operand(s), comment
D. mnemonic, operand(s), comment

(12) A machine cycle refers to

A. fetching an instruction
B. executing an instruction
C. fetching, decoding and executing an instruction
D. clock speed

(13) Which flag does the 80x86 use to check for unsigned arithmetic overflow?

A. OF B. SF **C. CF** D. None of the above

(14) SP is associated with ..... By default

A. ES B. DS **C. SS** D. CS

(15) What is the memory address of the next instruction if CS = 3456H and IP = ABCDH

A. E023H B. ABCDH **C. 3F12DH** D. AF126H

(16) Which register are used as an offset address for the string instruction destination in the microprocessor?

A. SI B. DX **C. DI** D. BX

(17) What is the purpose of the segment register in protected mode memory addressing?

A. selects the descriptor from a descriptor table
B. sets privilege level
C. chooses either the global or local table
D. All of the above

(18) The program-invisible registers are

A. The segment registers cache
B. segment registers
C. paging registers
D. Operating system registers

(19) The computer architecture aimed to reducing the time of execution of instructions is

A. CISC **B. RISC** C. 8086 D. ISA

(20) Stack memory is maintained by two registers

A. BP,BI **B. SS,SP** C. CS,SP D. None of the above

2. (3 points) List with examples 5 different addressing mode.

Solution:

3. (3 points) Briefly describe the purpose of each T state timing including the wait state in the 8086 processor read bus cycle.

Solution:

4. (3 points) Calculate the memory access time of a 10 MHZ processor. Assume address valid delay (T_{CLAV}) is 90 ns, data setup time (T_{DVCL}) is 40 ns,

Solution:

5. (3 points) What is the operation of 8086 pin Connections ALE, INTR and NMI.

Solution:

6. (3 points) What is the difference of processor operating modes (real , protected and flat mode).

Solution:

7. (3 points) [Bonus Question] Why processors implement Memory Paging as a memory management technique ? What is the purpose of Write Through (WT) and Dirty bits in page registers.

Solution:

With My Best Wishes
Dr.Ahmed Bayoumi