

University of Jordan
Faculty of Engineering & Technology
Computer Engineering Department
Microprocessors & Assembly Language

Mid-term exam

Date: 4/4/2009

Student name(Arabic)	Student number	Section number	Instructor

IMPORTANT NOTES:

- **Make sure you have 11 questions on 5 pages numbered from 1 to 5.**
- **Start your exam in writing your name and number first.**
- **Calculators are forbidden.**
- **All your numeric answers should be in Hexadecimal.**
- **Any cheating attempt will be severely penalized.**

Q1) 4 marks

This question consists of 4 parts. For all parts, assume that the data segment content is as follows:

Memory Address	Memory Contents
1461:0000	AB
1461:0001	90
1461:0002	EF
1461:0003	CD
1461:0004	34
1461:0005	12
1461:0006	78
1461:0007	56
1461:0008	-03
1461:0009	01
1461:000A	04
1461:000B	00
1461:000C	02
1461:000D	00
1461:000E	01
1461:000F	00

A- Find the value of AX after executing the following code

```
MOV AX, 1461h
MOV DS, AX
MOV AL, 05
MOV AH, 07
```

AX=	0705
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B- Find the value of AX after executing the following code

```
MOV AL, [0005h]
MOV AH, [0007h]
```

AX=	5612
-----	-------------

C- Find the value of AX after executing the following code

MOV AX, [0004h]

AX=	1234
-----	-------------

D- Find the value of AX after executing the following code:

MOV BX, [000Eh]

MOV DI, [000Eh]

MOV AX, [BX+DI]

AX=	CDEF
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Q2) 4 marks

Assume that registers contain the following values:

Reg.	Value (hex)	Reg.	Value (hex)
AX	0111	DI	0002
BX	0022	BP	0003
CX	0003	ES	0004
DX	0400	SI	0001

Analyze the following code and determine the final values for SI, DI, BP, and ES.

**PUSH ES
PUSH DI
POP ES
PUSH BP
POP DI
PUSH ES
POP SI
POP SI**

SI=	0004	DI=	0003
BP=	0003	ES=	0002

Q3) 4 marks

Using the register values listed below, determine the *physical* memory address (or addresses) of the byte or bytes read or written in each of the instructions.

Reg.	Value(hex)	Reg.	Value(hex)	Reg.	Value(hex)
BX	E222	DI	3000	CS	2555
BP	CADD	SI	0004	DS	1010
ES	1114	SS	5500	SP	1331

A) **ADD DL , [BX+DI]**

	High address	Low address
The memory address(es) of the byte(s) is (are)		21322

B) XOR ES:[DI], CL

The memory address(es) of the byte(s) is (are)		14140
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C) SUB CX, [BP+2]

The memory address(es) of the byte(s) is (are)	61AE0	61ADF
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D) PUSH SI

The memory address(es) of the byte(s) is (are)	5632F	56330
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Q4) 4 marks

For the following instructions, decide which instructions are valid and which are invalid. Fill the box opposite to each instruction with V if valid and I if invalid. In case of invalid state the reason

Instruction	Valid or Invalid	Reason
MOV DX, [AX + DI]	I	
MOV AL, BX[2]	I	
ADD SI, CL	I	
CMP CL,[BX+DI+1122]	V	

Q5) 3 marks

If the contents of AL equal **-1** and the contents of CL are **-2**, what will be the result produced in AX by executing the instruction?

a) MUL CL

AX=	FD02
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b) IMUL CL

AX=	0002
-----	-------------

c) CBW

AX=	FFFF
-----	-------------

Q6) 2 marks

Consider the following fragment of a code.

MOV AL, A5H ; first instruction
ADD AL, 62H ; second instruction
ADC AL, 01 ; third instruction

A) What are the contents of AX after the second instruction?

AX=	0007
-----	-------------

B) What are the contents of AX after the third instruction?

AX=	0009
-----	-------------

Q7) 3 marks

Develop a sequence of instructions that copies 16 bytes of data from an area of memory addressed by DATAS into an area of memory addressed by DATAD.

**MOV SI, OFFSET DATAS
MOV DI, OFFSET DATAD
CLD
MOV CX, 16
REP MOVSB**

Q8) 1 marks

If DI = 1000H. What will be the value stored in register DI after the execution of the following instructions

**CLD
MOV CX, 25
REP INSB**

DI= **1019**

Q9) 2 marks

If memory locations labeled LIST1 contain 12F3E4C5B7A8H. What will be the value stored in the following registers after the execution of the following instruction

LDS EDI, LIST1

DS= **A8 B7**

EDI= **C5 E4 F3 12**

Q10) 3 marks

What are the values in AX, BX, CX, and DX after executing the following set of instructions?

**MOV AX, 0
MOV CX, 5**

Count:

**ADD AX, CX
MOV BX, AX
ADD AX, BX**

LOOP Count

AX	BX	CX
0102H (258)	0081H(129)	00

Q11) 2 marks

Write the value stored in AL, SI, CX after the execution of the following code.

```
. DATA
GRADES DW 15,12,14,10, 18, 16,11,17,19,9
.CODE
MOV AX,0
MOV SI,2
MOV CX,5
L1:
    ADD AX,GRADES[SI]
    ADD SI,2
LOOP L1
```

AX=	0046H(70)
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SI=	000CH(12)
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