



Philadelphia University
Faculty of Engineering

Marking Scheme

Examination Paper

Department of CE

Module: Microprocessors (630313)

Second Exam

First Semester

Date: 26/12/2018

Section 1

Weighting 20% of the module total

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Marking Scheme Microprocessors (630313)

The presented exam questions are organized to overcome course material, the exam contains 4 questions; *all questions* are compulsory requested to be answered. Thus, the student is permitted to answer any question out of the existing ones in this section.

Marking Assignments

Question 1 This question is attributed with 6 marks if answered properly, The answer for this question as the following:

Question 1 Multiple Choices

(6 marks)

- 1) The instruction **MOV AX, X1[EDI]** is an example of
 - a) **indexed addressing**
 - b) **indirect addressing**
 - c) **direct addressing**
 - d) **based addressing**
- 2) Which of the following is an **illegal** 8086 instruction?
 - a) **add ax, [di]**
 - b) **mov ax, [bx]**
 - c) **INC [EDI]**
 - d) **aDd bx, [bx]**
- 3) Let **X1** be an array of **words**, one of the following is a correct code to set the **fifth** element in **X1** to **FF**
 - a) **mov X1+5, FFh**
 - b) **mov X1+4, FFh**
 - c) **mov X1+10, FFh**
 - d) **mov X1+8, FFh**
- 4) What will be the contents of register **AL** after the following has been executed


```
MOV BX, F78C
MOV AL, 7E
ADD AL, BL
```

 - a) **6A and carry flag is set**
 - b) **6A and carry flag is reset**
 - c) **0A and carry flag is set**
 - d) **0A and carry flag is reset**
- 5) If **CX =1234H** and **BX=75FDH** what is the value stored in **CX** after the execution of the following instruction.


```
TEST CX, BX
```

 - a) **1234H**
 - b) **77FDH**
 - c) **75FDH**
 - d) **1032H**
- 6) Given that **AL** register contains the **ASCII** code of an uppercase letter, it can be converted to lowercase by
 - a) **add AL, 30**
 - b) **or AL, 0010 0000**
 - c) **and AL, 0010 0000**
 - d) **sub AL, 30**

Question 2 This question is attributed with 5 marks, if answered properly.
The answer for this question as the following:

a)

(2 marks)

Ñ	Instruction	Answer	Reason
[1]	mov IP, num1	illegal	IP can't be destination
[2]	xchg AL, num2	legal	
[3]	sub char1, 'A'	legal	
[4]	inc num3, 1	illegal	Incorrect syntax (one operand for inc instruction)

b)

(3 marks)

Ñ	Before	Instruction executed	After
[1]	EAX: 00 00 00 75 h ECX: 00 00 01 A2 h	sub ecx, eax	EAX = 00 00 00 75h ECX = 00 00 01 2Dh SF = 0 ZF = 0 CF = 0 OF = 0
[2]	AX: 77AC h CX: 4B35 h	add ax, cx	AX = C2E1 CX = 4B35 SF = 1 ZF = 0 CF = 0 OF = 1
[3]	EDX: 7F FF FF FF	inc edx	EDX = 80 00 00 00 SF = 1 ZF = 0 OF = 1

Question 3 This question is attributed with 4 marks, if answered properly. The complete code as the following:

Solution

```
Title Sum.asm
.Model flat, stdcall
.Data
    Temperatures SByte +13,-10,+19,+14,-18 ;
main PROC
.Code
    mov BH, 0;
    mov ESI, OFFSET Temperatures;
    mov ECX, LENGTHOF Temperatures;                (2 marks)
L1:
    add BH, [ESI]
    add ESI, Type Temperatures
    loop L1
    exit
main ENDP
END main                                           (2 marks)
```

Question 4 This question is attributed with 5 marks, if answered properly. The complete code as the following:

Solution

```
Title Compare.asm
.Model small
.Data
    str1      Byte    "first string ", 0
    str2      Byte    " second string ", 0
    str1L EQU  SIZEOF str1
    str2L EQU  SIZEOF str2
    str3      Byte    str1L+str2L-1 dup("0")
main PROC
.Code
MOV AX, @DATA
MOV DS, AX                (2 marks)
MOV SI, 0;
MOV CX, str1L-1;
L1:
    MOV AL, str1[SI]
    MOV str3[SI], AL
    INC SI
    LOOP L1
MOV SI, 0;
MOV DI, str1L
MOV CX, str2L-1;
L2:
    MOV AL, str2[SI]
    MOV str3[DI], AL
    INC SI
    INC DI
    LOOP L2
exit
main ENDP
END main                                           (3 marks)
```