



Philadelphia University
Faculty of Engineering

Marking Scheme

Examination Paper

Department of CE

Module: Microprocessors (630313)

Second Exam

Second Semester

Date: 09/05/2019

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:

1) What is the value of **EAX** after the execution of the code below?

```
array WORD 100, 200,  
        300, 3 DUP(350),  
        400, 500, 700  
  
MOV EAX, SIZEOF array
```

- | | |
|-------|------|
| a) 2 | b) 9 |
| c) 18 | d) 4 |

2) Given that the **BL** register contains 'B', the effect of the following instruction
OR BL, 0010 0000b

is to

- | | |
|--------------------|--------------------------|
| a) clear BL | b) store 0010 0000 in BL |
| c) store 'b' in BL | d) leave BL unchanged |

3) What is the result in **AL** after executing the following instructions?

```
XOR AL, AL  
OR AL, 80H
```

- | | |
|--------|----------------------|
| a) 80H | b) 88H |
| c) 00H | d) None of the above |

4) What is the value of **AX** register after executing,

```
MOV AX, 456h  
CMP AX, 456h
```

- | | |
|---------|------------|
| a) Zero | c) 456h |
| b) FFFh | d) Unknown |

5) What will be the final value in **EDX** after this code executes?

```
mov edx, 1  
mov eax, 7FFFh  
cmp eax, 8000h  
jb L1  
mov edx, 0  
L1:
```

- | | |
|-------|------------------|
| a) 0 | b) 1 |
| c) 10 | d) None of above |

6) How many times will the following loop execute?

```
X2: mov cx, 0  
    inc ax  
    loop X2
```

- | | |
|---------|------------|
| a) 0 | b) 1 |
| c) FFFF | d) forever |

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

Solution

1. Direct addressing mode
2. Direct-offset addressing mode
3. Indirect addressing mode
4. Indexed addressing mode

Question 3 This question is attributed with 6 marks, if answered properly. The complete code as the following:

a)

№	instruction	answer
a)	mov ax, Xbyte [si]	I (Operand size mismatch)
b)	add dx, [cx+ Yword]	I(CX is not a base or index register)
c)	mov ax, [bx+4]	V
d)	mov [bx],[si]	I (memory to memory not permitted)

b)

```

mov ax, WORD PTR [varB+2] ;    ax = ----- 0502h
mov BL, BYTE PTR varD ;      BL = ----- 78h
mov BL, BYTE PTR [varW+2] ;   BL = ----- 02h

```

c)

№	Instruction	Answer
[1]	mov eax,offset X +3	00000003h
[2]	mov dx, Y+4	3333h
[3]	mov esi,offset MSG-1	0000000Bh

d)

Answer
OF=0 SF=1,

Question 4 This question is attributed with 6 marks, if answered properly. The complete code as the following:

<i>Solution</i>	
<pre> Title Compare.asm .686 .Model flat, stdcall Include Irvine32.inc .Data MSG Byte "The arrays must have the same size", 0 X SDWORD 13, 14, 98, 67, 50 Y SDWORD 5, 14, 9, 89, 50 XS = Lengthof X YS = Lengthof Y Z SDWORD XS Dup (?); (1.5 marks) .Code main PROC MOV EAX, XS CMP EAX, YS JNE Finish (1 mark) MOV ESI, 0 MOV ECX, XS L2: MOV EAX, X[ESI] CMP EAX, Y[ESI] JLE Zeros MOV Z[ESI], 1 JMP L1 Zeros: MOV Z[ESI], 0 L1: ADD ESI, TYPE X </pre>	

LOOP L2

JMP Fin

(2.5 marks)

Finish:

MOV EDX, OFFSET MSG

CALL WriteString

(1 mark)

Fin:

exit

main ENDP

END main