Marking Scheme

Examination Paper

Department of CE

Module: Microprocessors (630313)

First Exam   First Semester   Date: 21/11/2018

Section 1

Weighting 20% of the module total

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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

The following scheme shows the marks assignments for each question. They show also the steps for which a student can get marks along the related procedure he/she achieves.

Question 1 This question is attributed with (35 points) if answered properly, The answer for this question as the following:

1) Actual execution of instructions in a computer takes place in

   a) **Control Unit**   b) **Storage unit**
   c) **ALU**   d) **None of the above**

2) The first processor that includes **Virtual Memory** in the Intel microprocessor family was:

   a) **4004**   b) **80286**
   c) **80486**   d) **Pentium Pro**

3) If **DS = 90A3H**, then the range of physical addresses for the data segment is:

   a) **90A30H – 9FA30H**   b) **00000H – 090A3H**
   c) **090A3 – 190A2H**   d) **90A30 – A0A2FH**

4) Which utility program reads an assembly language source file and produces an object file?

   a) **assembler**   b) **compiler**
   c) **loader**   d) **linker**

5) One of the following **memory models** combines the data and code parts:

   a) **Flat**   b) **Meduim**
   c) **Small**   d) **Huge**

6) Which of the following is an **invalid** instruction?

   a) **add dx, dx**   b) **MOV AX, CS**
   c) **sub bar,5**   d) **MOV AH, DI**

7) In the following data definition, assume that **Marks** begins at offset **2100h**. What is the offset of the value (**77**)?

   ```
   Marks  WORD      88, 44, 55, 90, 77
   ```
   a) **2104h**   b) **2105**
   c) **2108**   d) **None of above**

Question 2 This question is attributed with 35 points if answered properly, The answer for this question as the following:

a) **Put √ in front of correct statement and ✕ in front of wrong one**   10 points

Ñ	statement	Answer
a)	Data transfer instructions can affect the flag bits	X
b)	In real−mode addressing if the beginning segment address is 028FH the memory location having an effective address of 03FFFH lies within the segment.	√
c)	The maximum size of memory segment is 640K bytes of memory	X
d)	The combinations (DS:BX) locates the next instruction executed by the microprocessor.	X

b) **Describe the special uses for each of the following registers.**   12.5 points

Register	Typical Uses
EAX	Accumulator register. Used in arithmetic operations Accumulator for operands and results
EDX	Data register. Used in arithmetic operations and I/O operations
ESP	Stack Pointer register. Pointer to the top of the stack
ESI	Source register. Used as a pointer to a source in stream and array operations
EIP	Instruction Pointer

c) **List five steps of Instruction Execution Cycle.** 12.5 points

Question 3 This question is attributed with 10 points, if answered properly.

The answer for this question as the following:

a) Array of **10 unsigned double words** initialized to **1, 2, ..., 10**.

Solution
Y DWORD 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

b) Null-terminated string with a message "**Please enter a string**"

Solution
prompt_msg2 db "Please enter a string: ",0

c) Declare an uninitialized byte labeled "**var2**".

Solution
var2 DB ?

d) Declare **100** 4-bytes words, all initialized to **0**, starting at memory location "**arr**".

Solution
arr DD 100 DUP(0)

Question 4 This question is attributed with 20 points, if answered properly.

The complete code for this question as the following:

Solution

```
TITLE Equations Calculation Cal.asm
.data
; variables declaration:
J       sword       50
K       sword       -20
L       sword       ?
W       word        254
Y       word        200
Z       word        100;          8  points
.code
main PROC
; Compute L =J+K; W=W-Y-Z+10
mov ax, J
add ax, K
mov L, ax
mov ax, W
sub ax, Y
sub ax, Z
add ax, 10
mov W, ax
main ENDP
END main                     12  points
```