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| **Cairo University** | **CMP[N]201** | **Total: Points** |
| **Faculty of Engineering** | **Microprocessor Systems** | **2015-2016** |
| **Computer Eng. Department** | **Midterm Exam** | **One Hour** |

**This is an open-book, open notes exam. All electronic devices - Except calculators - are forbidden.  
Make any reasonable assumptions (if necessary)  
Answer the following questions**

1. [2] Increasing the address bus width increases
2. [4] What is the function of the following programs

|  |  |
| --- | --- |
| MOV CX,0002H  MOV AX,A  ADD AX,B  DIV CX | MOV AX,A  MOV BX,B  DIV BX |

**Answer:**

1. [4] Allocate syntax errors of the following program

|  |  |
| --- | --- |
| MOV AX,01234H  DIV 20H  ADD AL,052H  MOV FR,AX  MOV DX,20H  ADD 2[DI],DL  MOV [SI],[DI]  MOV VAR1,[SI] |  |

1. [4] Write a single instruction for each of the following operations. Note that no other changes should occur.
   1. Multiply the content of AX by 16:
   2. Change the sign of the content of AX:
2. [2] Identify the operand addressing mode used in each of these instructions.
3. CMP WORD PTR [200],10
4. MOV IVAL[DI+4], CX
5. Assume there is a machine with the following specifications: Address bus=24 bits, data bus= 16bits and All registers are 32bits width. The segment size = The maximum addressable memory size=
6. [3] The designer of this machine has been fired. Why?

**Answer:**

1. [4] Assume there are no stack. Suggest two alternatives:
2. Faster alternative:
3. Cheaper alternative:
4. [3] If an instruction that needs to be fetched is in physical memory location 389F2 and CS = 2700, does the code segment range include it or not? If not, what value should be assigned to CS if the IP must be = 1282? **Answer:**
5. [2] What are the modified registers by calling each of the following codes?

|  |  |
| --- | --- |
| FUNC1 PROC  MOV AL,0C1h  FUNC1 ENDP | FUNC1 MACRO  MOV AL,0C1h  ENDM FUNC1 |

**Answer:**

1. [2] For a complicated back and white image, it is preferable to use (low/high) resolution video mode because
2. [2] 10000000 = [as an unsigned number] and 10000000 = [as a signed number]
3. [3] What will be the value in AX after executing the following instructions? Assume that DS and ES are set up appropriately to access the variable ‘array’. Give the answer in hexadecimal:

array dw 1111h, 2222h, 3333h, 4444h

mov bx,1

mov si,6

mov ax,array[bx][si-2]

**Answer:**

1. [4] Ask the user to input two numbers. Display the difference. As the following:

Enter the first number: 4

Enter the second number: 5

4+5=-1

1. [4] Write a program that replaces the last six characters of STR1 with the last six characters of STR2

STR1 DB ‘MY NAME IS HASSAN’

STR2 DB ‘MY NAME IS KHALED’