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| --- | --- | --- | --- | --- |
| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course Name:** | **Computer Org & Assembly Lang** | **Course Code:** | **EE2003** |
| **Program:** | **BS (Computer Science)** | **Semester:** | **Spring 23** |
| **Section** | **M** | **Total Marks:** | **15** |
| **Date:** | **13-2-2023** | **Weight** | **~2.5%** |
| **Exam Type:** | **Quiz 1 a** | **CLO #:** | **1** |
| **Name: Roll No.: Section:** | | | | |

**Question 1**

What component of the computer defines the size (bitness) of the CPU?

[2 marks]

Primarily, size of ALU defines the bitness of CPU

Registers can also be considered correct.

Size of address bus or data bus is WRONG.

**Question 2**

Show how the data 0x41870B2A will be stored in the memory, starting at address 0x600. Assume that big endian format is adopted by this computer.

[3 marks]

|  |  |
| --- | --- |
| Address | Data |
| 600 | 41 |
| 601 | 87 |
| 602 | 0B |
| 603 | 2A |

**Question 3**

What are the first and the last physical addresses derivable from the following segment register values.

[4 marks]

|  |  |  |
| --- | --- | --- |
| Segment Register | First physical address | Last physical address |
| CS = 2010h | 20100 | 300FF |
| SS = F320h | F3200 | 031FF |

**Question 4**

Assuming the instruction in left column form a complete program, write the value of register AX after each instruction. Also assume that each instruction is exactly 3 bytes long in machine code.

[6 marks]

|  |  |
| --- | --- |
| **Instruction** | **AX Value (hex)** |
| [org 100h] | ---- |
| Mov ax, [mylist] | 4120 |
| Mov ax, 0 |  |
| Mov ah, [mylist+3] | 1A00 |
| Mov ax, 0 |  |
| Mov al, [myvalue+1] | 0000 |
| Mov ax, 0 |  |
| Mov ax, mylist | 011B |
| Mov ax, 4c00h  int 21h  mylist: db 20h, 41h, 36h, 1Ah  myvalue: dw 5h, 9h | ---- |

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| **Date:** | **13-2-2023** | **Weight** | **~2.5%** |
| **Exam Type:** | **Quiz 1 b** | **CLO #:** | **1** |
| **Name: Roll No.: Section:** | | | | |

**Question 1**

Differentiate between based register indirect and indexed register indirect addressing modes.

[2 marks]

Both are used to get data from memory when the address is stored in a register

Difference is that based indirect uses base registers BX and BP. Indexed indirect uses index registers SI, DI.

**Question 2**

Show how the data 0x2A62FC05 will be stored in the memory, starting at address 0x4A0. Assume that little endian format is adopted by this computer.

[3 marks]

|  |  |
| --- | --- |
| Address | Data |
| 4A0 | 05 |
| 4A1 | FC |
| 4A2 | 62 |
| 4A3 | 2A |

**Question 3**

What are the first and the last physical addresses derivable from the following segment register values.

[4 marks]

|  |  |  |
| --- | --- | --- |
| Segment Register | First physical address | Last physical address |
| CS = 0042h | 00420 | 1041F |
| SS = F500h | F5000 | 04FFF |

**Question 4**

Assuming the instruction in left column form a complete program, write the value of register AX after each instruction. Also assume that each instruction is exactly 3 bytes long in machine code.

[6 marks]

|  |  |
| --- | --- |
| **Instruction** | **AX Value (hex)** |
| [org 100h] | ---- |
| Mov ax, myvalue | 0123 |
| Mov ax, 0 |  |
| Mov al, [mylist+5] | 0000 |
| Mov ax, 0 |  |
| Mov ah, [myvalue+1] | 0900 |
| Mov ax, 0 |  |
| Mov ax, [myvalue] | 0905 |
| Mov ax, 4c00h  int 21h  mylist: dw 20h, 41h, 36h, 1Ah  myvalue: db 5h, 9h | ---- |