**Military College of Signals**

**Department of Computer Software Engineering**

**Computer Organization and Architecture**

**Spring 2012 BESE 16 A and B**

**Mini Project 01 – INSTRUCTION SET**

**Total Marks: 20**

**Due date: *9th March, 2012***

***INSTRUCTIONS***

1. Execute the assignment in groups of not more than two students.
2. The assignment should illustrate all steps.
3. The instruction set is given in Table 1 and Figure 1 shows the instruction format.
4. A correct assignment that lacks aesthetic sense is not the same as a correct assignment that exhibits it.
5. It is recommended that solve the assignment on a chart paper using different colours.

**Q1: TRACE (5+5)**

Show the trace of executions (step-by-step) for the code shown in Table 2 and Table 3. Show the effects on PC, AC, IR, memory and Display. Write the mathematical equation that is evaluated using the code in table 2 and Table 3.

Figure 1: Instruction Format

Table 1: Instruction Table

|  |  |
| --- | --- |
| **Instruction Code** | **Description** |
| 1AAA | AC = [AAA] (read) |
| 2AAA | [AAA] = AC (write) |
| 3AAA | AC = AC + [AAA] |
| 4AAA | AC = AC – [AAA] |
| 5XXX | Display the contents of AC on screen |
| 6AAA | AC = AC \* [AAA] |
| 0XXX | Halt instruction |

Table 2: Memory Program A

|  |  |
| --- | --- |
| **Address** | **Memory Cell Value** |
| 301 | 1307 |
| 302 | 3307 |
| 303 | 4307 |
| 304 | 2307 |
| 305 | 5307 |
| 306 | 0307 |
| 307 | 0006 |

Table 3: Memory Program B

|  |  |
| --- | --- |
| **Address** | **Memory Cell Value** |
| 301 | 1306 |
| 302 | 4307 |
| 303 | 5219 |
| 304 | 0123 |
| 305 | DEAD |
| 306 | 01AF |
| 307 | 01AE |

**Q2: CODE WRITING (10)**

Write code that performs the functions in A, B and C (separately) and provide the complete trace. The instruction set is given in Table 1. Use the last three digits of your NC/PC/SC/PA number (of the younger syndicate member) as the start address in RAM.

1. 6!
2. , for x = 2 and y = 3
3. , for x = 4 and y = 3

**THE END**