**Experiment No-01:**

**Problem Name:** Write the machine codes of a sample program to MDA-8086, execute it and verify the results.

**Data Table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instruction** | **AX** | **BX** | **DX** | **Set Flag Bits(s)** | **IP** |
| **Initial Status** | 0000 | 0000 | 0000 | I | 0000 |
| **MOV AX, 1039H** | 1039 | 0000 | 0000 | I | 0003 |
| **MOV DX, 0540H** | 1039 | 0000 | 0540 | I | 0006 |
| **ADD AX, DX** | 1579 | 0000 | 0540 | I | 0008 |
| **MOV BX, 0050H** | 1579 | 0050 | 0540 | I | 000B |
| **SUB AX, BX** | 1529 | 0050 | 0540 | I | 000D |
| **INC DX** | 1529 | 0050 | 0541 | P,I | 000E |
| **DEC BX** | 1529 | 004F | 0541 | A,I | 000F |
| **HLT** | 1529 | 004F | 0541 | A,I | 000F |

**Experiment No-02:**

**Problem Name:** Write the machine codes for Logic operations (NOT,AND,OR,XOR,TEST) in assembly language.

**Data Table:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Offset Address** | **Instruction** | **AX** | **BX** | **CX** | **DX** | **Set Flag Bits(s)** | **IP** |
| **1000** | **Initial Status** | 0000 | 0000 | 0000 | 0000 | I | 0000 |
| **1000**  **1001**  **1002** | **MOV AX, 1039H** | 1039 | 0000 | 0000 | 0000 | I | 0003 |
| **1003**  **1004**  **1005** | **MOV BX,5A27H** | 1039 | 5A27 | 0000 | 0000 | I | 0006 |
| **1006**  **1007**  **1008** | **MOV CX,54A5H** | 1039 | 5A27 | 54A5 | 0000 | I | 0009 |
| **1009**  **100A** | **OR AX, BX** | 5A3F | 5A27 | 54A5 | 0000 | P,I | 000B |
| **100B**  **100C** | **XOR AX, CX** | 0E9A | 5A27 | 54A5 | 0000 | P,I | 000D |
| **1000D**  **100E** | **NOT AX** | F165 | 5A27 | 54A5 | 0000 | P,I | 000F |
| **100F** | **TEST CX, BX** | F165 | 5A27 | 54A5 | 0000 | I | 0011 |
| **1011**  **1012** | **AND CX, AX** | F165 | 5A27 | 5025 | 0000 | I | 0013 |

**Experiment No-03:**

**Problem Name:** Write the machine codes for control instructions (JUMP Commands) in assembly language.

**Data Table:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Offset Address** | **Instruction** | **AX** | **BX** | **CX** | **DX** | **Set Flag Bits(s)** | **IP** |
| **1000** | **Initial Status** | 0000 | 0000 | 0000 | 0000 | I | 0000 |
| **1000**  **1001**  **1002** | **MOV AX, 1039H** | 1039 | 0000 | 0000 | 0000 | I | 0003 |
| **1003**  **1004**  **1005** | **MOV BX, 95A3H** | 1039 | 95A3 | 0000 | 0000 | I | 0006 |
| **1006**  **1007** | **ADD AX, BX** | A5DC | 95A3 | 0000 | 0000 | S,I | 0008 |
| **1008**  **1009** | **JC NSTU** | A5DC | 95A3 | 0000 | 0000 | S,I | 000A |
| **100A**  **100B**  **100C** | **ICE: OR AX, 23H** | A5FF | 95A3 | 0000 | 0000 | S,P,I | 000D |
| **100D**  **100E** | **JNZ LAST** | A5FF | 95A3 | 0000 | 0000 | S,P,I | 0016 |
| **100F**  **1010**  **1011** | **NSTU: MOV CX, 0FC7H** |  |  |  |  |  |  |
| **1012**  **1013** | **SUB AX,CX** |  |  |  |  |  |  |
| **1014**  **1015** | **JZ ICE** |  |  |  |  |  |  |
| **1016** | **LAST: HLT** | A5FF | 95A3 | 0000 | 0000 | S,P,I | 0016 |

**Experiment No-04:**

**Problem Name:** Write the machine codes for control instructions (SHIFT,ROTATE) in assembly language.

**Data Table:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Offset Address** | **Instruction** | **AX** | **BX** | **CX** | **DX** | **Set Flag Bits(s)** | **IP** |
| **1000** | **Initial Status** | 0000 | 0000 | 0000 | 0000 | I | 0000 |
| **1000**  **1001**  **1002** | **MOV AX, 1039H** | 1039 | 0000 | 0000 | 0000 | I | 0003 |
| **1003**  **1004**  **1005** | **MOV DX, 0505H** | 1039 | 0000 | 0000 | 0505 | I | 0006 |
| **1006**  **1007** | **MOV CL, 3** | 1039 | 0000 | 0003 | 0505 | I | 0008 |
| **1008**  **1009** | **SAL AX, CL** | 81C8 | 0000 | 0003 | 0505 | S,O,I | 000A |
| **100A**  **100B** | **SAR DX, CL** | 81C8 | 0000 | 0003 | 00A0 | C,O,P,I | 000C |
| **100C**  **100D** | **MOV CL, 2** | 81C8 | 0000 | 0002 | 00A0 | C,O,P,I | 000E |
| **100E**  **100F** | **ROR AX, CL** | 2072 | 0000 | 0002 | 00A0 | O,P,I | 0010 |
| **1010**  **1011** | **ROL DX, CL** | 2072 | 0000 | 0002 | 0280 | P,I | 0012 |
| **1012** | **STC** | 2072 | 0000 | 0002 | 0280 | C,P,I | 0013 |
| **1013**  **1014** | **RCL AL, CL** | 20CA | 0000 | 000 | 0280 | C,P,I | 0015 |
| **1015**  **1016** | **RCR DX, CL** | 20CA | 0000 | 0002 | 40A0 | P,I | 0017 |