**EX. NO: 1a**

**DATE:**

**Arithmetic and logical operation using 8051 MICROCONTROLLER**

**PROBLEM STATEMENT:**

Calculate the Body Mass Index for the subject with a given height and weight

**APPARATUS REQUIRED:**

                  8051 microcontroller kit, +5v power supply

**ALGORITHIM:**

1. Load register R0 with data 2
2. Load register R1 with data 8
3. Load A with content stored in register R0
4. Load B with content stored in register R0
5. Multiply accumulator with data stored in B register
6. Load B with content stored in A
7. Load A with content stored in register R1
8. Divide accumulator with data stored in B register
9. An infinite loop to stop execution

**PROCEDURE:**

* Load register R0 with 2 and R1 with 8
* Store the value of register R0 in accumulator and B register
* Multiply accumulator and register B
* Store the value of accumulator in B
* Store the value of register R1 in accumulator
* Divide accumulator with data stored in B register

**PROGRAM:**

| **ADDRESS** | **MNEMONICS** | **OPERAND** | **OPCODE** | **REMARKS** |
| --- | --- | --- | --- | --- |
| 0000 | MOV | R0,#02H | 7802 | Load register R0 with data 2 |
| 0002 | MOV | R1,#08H | 7908 | Load register R1 with data 8 |
| 0004 | MOV | A,R0 | E8 | Load A with content stored in register R0 |
| 0005 | MOV | B, R0 | 88F0 | Load B with content stored in register R0 |
| 0007 | MUL | AB | A4 | Multiply accumulator with data stored in B register |
| 0008 | MOV | B,A | F5F0 | Load B with content stored in A |
| 000A | MOV | A,R1 | E9 | Load A with content stored in register R1 |
| 000B | DIV | AB | 84 | Divide accumulator with data stored in B register |
| 000C | L1: SJMP | L1 | 80FE | An infinite loop to stop execution |

**RESULT:**

Thus, an assembly language program to calculate body mass index was executed using 8051 microcontroller and the results were tabulated.

**EX. NO: 2**

**DATE:**

**Square and Cube program, Find 2’s complement of a number using 8051 microcontroller**

**problem statement:**

Perform y=x^2 +z +5 where x , z and y are 8 bit numbers

**APPARATUS REQUIRED:**

                  8051 microcontroller kit, +5v power supply

**ALGORITHIM:**

1. Load R0 with data 23
2. Load accumulator with contents stored in R0
3. Add the accumulator with data 5
4. Load R2 with content stored in accumulator
5. Load R1 with data 04
6. Load R3 with data 04
7. Load R1 with content stored in B register
8. Load accumulator with content stored in register R3
9. Multiply accumulator with data stored in B register
10. Add the accumulator with the contents stored in R2
11. An infinite loop to stop execution

**PROCEDURE:**

* Load register R0 with 23
* Store the value of register R0 in accumulator
* Add the accumulator with data 5
* Load register R2 with content stored in accumulator
* Store 04 in register R1 and R3
* Load register R1 with content stored in B register
* Load accumulator with content stored in register R3
* Multiply accumulator with data stored in B register
* Add the accumulator with the contents stored in R2

**PROGRAM:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ADDRESS** | **MNEMONIC** | **OPERAND** | **OPCODE** | **REMARK** |
| 0000 | MOV | R0, #23h | 7823 | Load R0 with data 23 |
| 0002 | MOV | A,R0 | E8 | Load accumulator with contents stored in R0 |
| 0003 | ADD | A, #05H | 2405 | Add the accumulator with data 5 |
| 0005 | MOV | R2, A | FA | Load R2 with content stored in accumulator |
| 0006 | MOV | R1, #04h | 7904 | Load R1 with data 04 |
| 0008 | MOV | R3, #04h | 7B04 | Load R3 with data 04 |
| 000A | MOV | B,R1 | 89F0 | Load R1 with content stored in B register |
| 000C | MOV | A, R3 | EB | Load accumulator with content stored in register R3 |
| 000D | MUL | AB | A4 | Multiply accumulator with data stored in B register |
| 000E | ADD | A, R2 | 2A | Add the accumulator with the contents stored in R2 |
| 000F | L1: SJMP | L1 | 80FE | An infinite loop to stop execution |

**RESULT:**

Thus, an assembly language program to find the value of y=x^2 +z +5 was written and executed using 8051 microcontroller and the results were tabulated.