

Task 1

6 × 2 = 12 marks

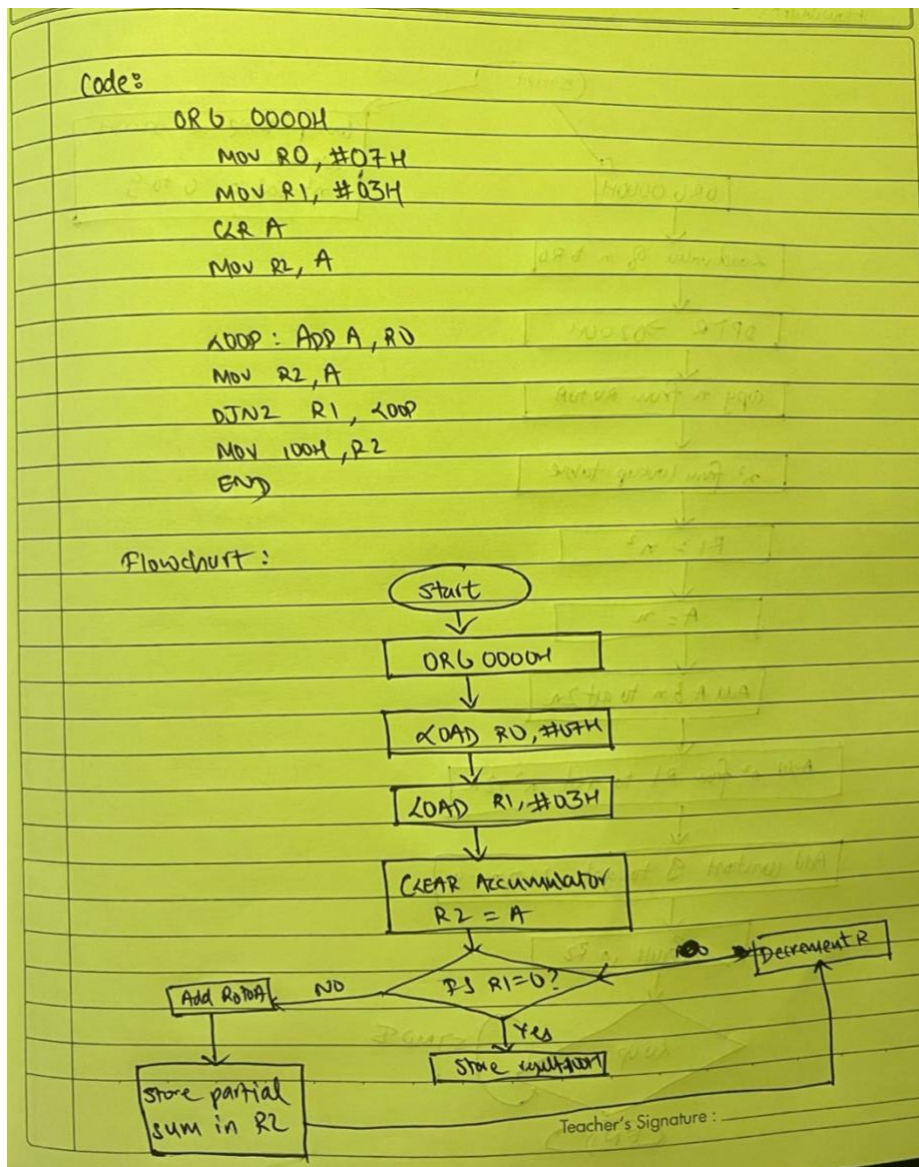
Name and Registration number: Apurba Koirala 22BCE3799

Each question carries six marks.

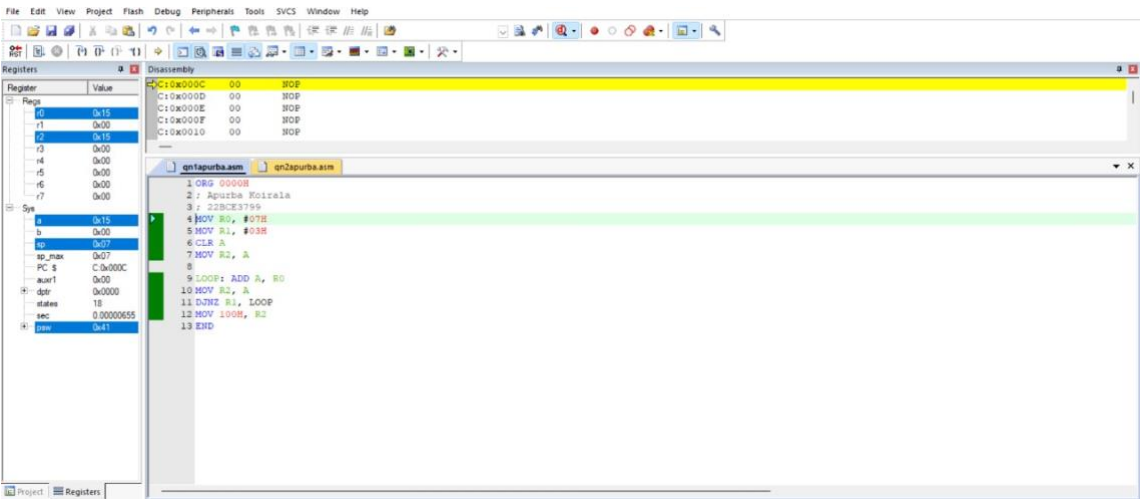
The task files should have handwritten flow chart/Algorithm, and written Program, Snapshot of typed program and Snapshot of output.

1. Write an assembly language program for multiplication of two 8-bit BCD numbers using the repeated addition logic. (NOTE: Without using MUL AB instruction)

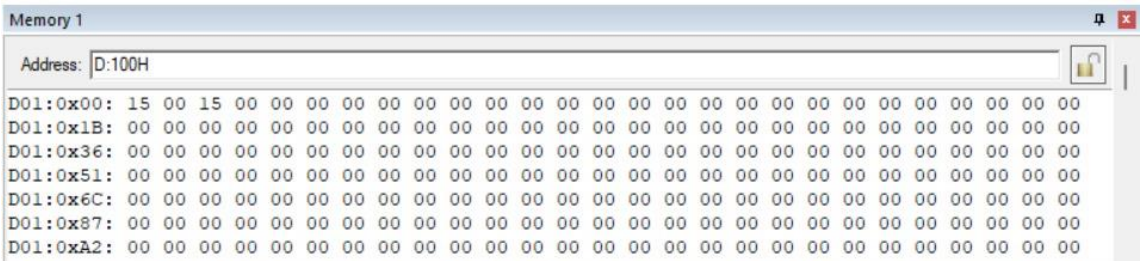
Code and Flowchart:



Snapshot of Code:



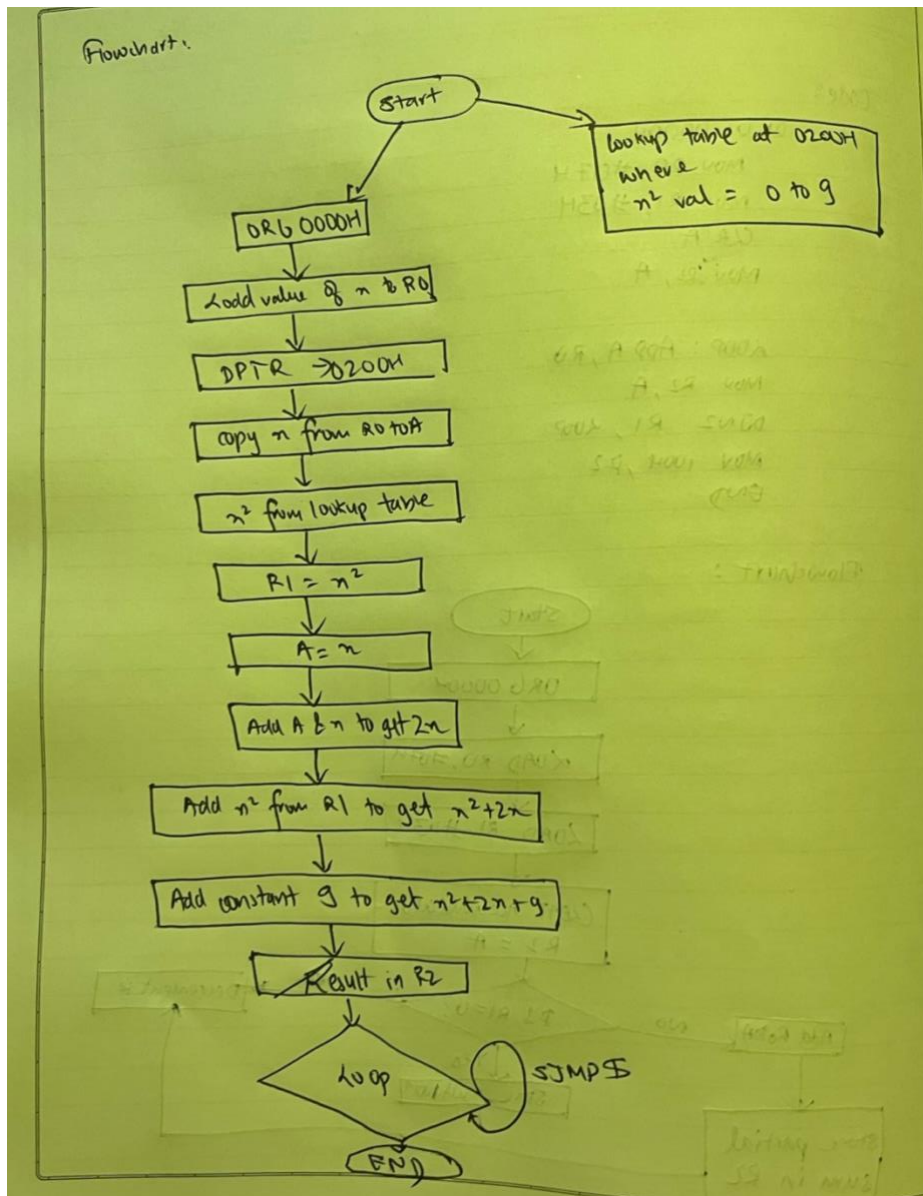
Output Snapshot:



2. Write a program to calculate y where $y = x^2 + 2x + 9$. x is between 0 and 9 and the lookup table for x^2 is located at the address (code space) of 200H. Register R0 has the x , and at the end of the program R2 should have y . Use the simulator to change the x value and single-step through the program, examining the registers as you go.

Code and Flowchart:

```
Code:
ORG 0000H
MOV R0, #05H
MOV DPTR, #200H
MOV A, R0
MOVC A, @A + DPTR
MOV R1, A
MOV A, R0
ADD A, R0
ADD A, R1
ADD A, #09H
MOV R2, A
SJMP $
ORG 0200H
DB 00H, 01H, 04H, 09H, 10H, 19H, 24H, 31H, 40H, 51H
END
```



Snapshot of Code:

Registers window shows values for R0 through R7, SP, PC, and other registers.

```

C:0x0000 7805 MOV R0, #0x05
C:0x0002 900200 MOV DPTR, #0x0200
8:
1: ORG 0000H
2:
3: MOV R0, #0x05
4: MOV DPTR, #0200H
5: MOV A, R0
6: MOVC A, @A+DPTR
7: MOV R1, A
8:
9: MOV A, R0
10: ADD A, R0
11: ADD A, R1
12: ADD A, #09H
13: MOV R2, A
14:
15: SJMP $
16: ORG 0200H
17: DB 00H, 01H, 04H, 09H, 16H, 25H, 36H, 49H, 64H, 81H
18:
19: END
  
```

Output Snapshot:

The screenshot shows the 'Memory' window with the address 'D:200H' entered. The memory dump displays hexadecimal values for addresses from D02:0x00 to D02:0xA2. Most of the displayed memory contains zero bytes.