Task 5

6 × 2 = 10 *marks*

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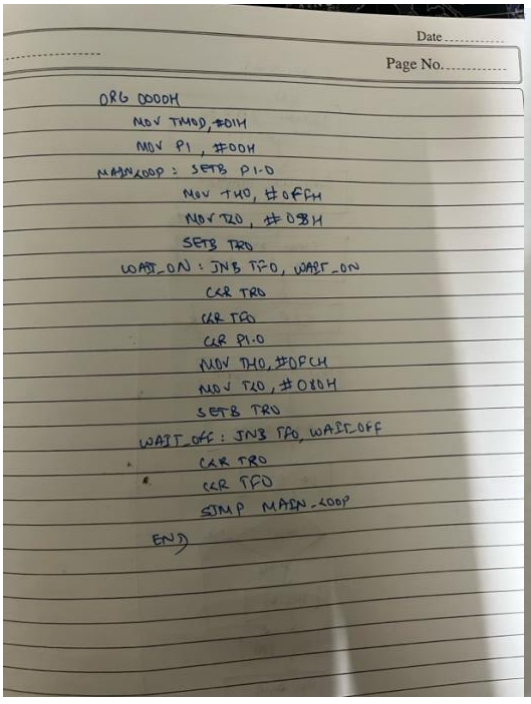
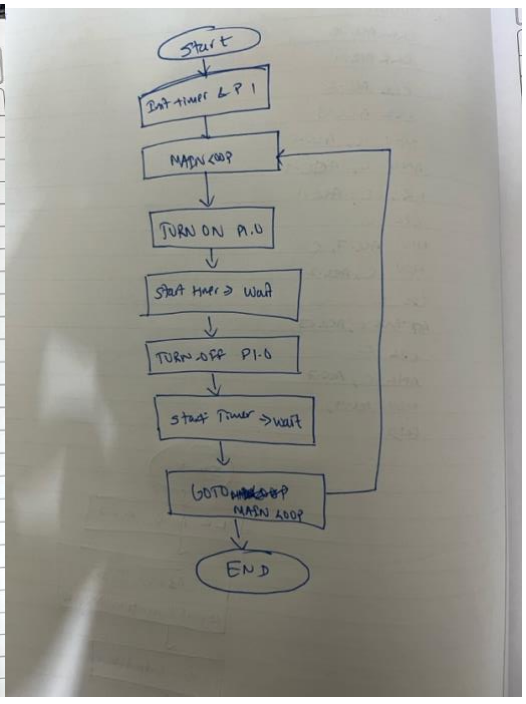
Each question carries six marks.

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 to generate a square wave of 1KHz with 20% duty cycle using timer programming.

   Written code and flowchart





   Code and Output:

   ORG 0000H

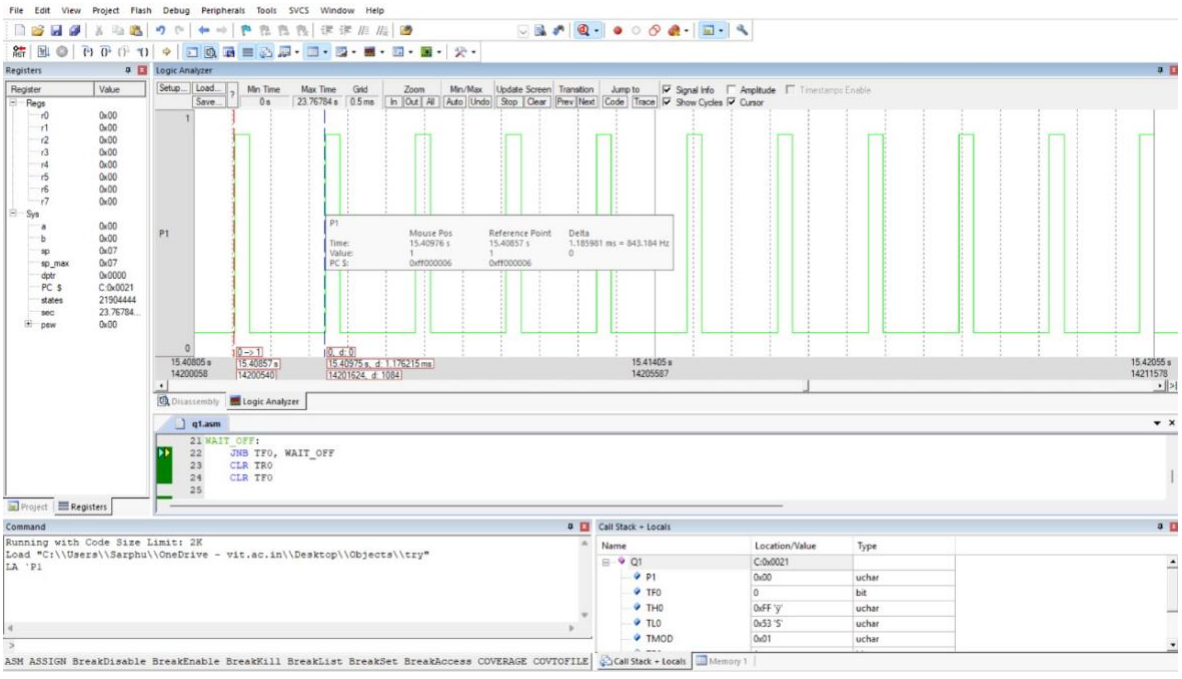
   MOV TMOD, #01H

   MOV P1, #00H

```
MAIN_LOOP:
   SETB P1.0

   MOV TH0, #0FFH
   MOV TL0, #058H
   SETB TR0
WAIT_ON:
   JNB TF0, WAIT_ON
   CLR TR0
   CLR TF0

   CLR P1.0

   MOV TH0, #0FCH
   MOV TL0, #080H
   SETB TR0
WAIT_OFF:
   JNB TF0, WAIT_OFF
   CLR TR0
   CLR TF0

   SJMP MAIN_LOOP

END
```

q1.asm

```
1  ORG 0000H
2  MOV TMOD, #01H
3  MOV P1, #00H
4
5  MAIN_LOOP:
6      SETB P1.0
7
8      MOV TH0, #0FFH
9      MOV TL0, #058H
10     SETB TR0
11 WAIT_ON:
12     JNB TF0, WAIT_ON
13     CLR TR0
14     CLR TF0
15
16     CLR P1.0
17
18     MOV TH0, #0FCH
19     MOV TL0, #080H
20     SETB TR0
21 WAIT_OFF:
22     JNB TF0, WAIT_OFF
23     CLR TR0
24     CLR TF0
25
26     SJMP MAIN_LOOP
27
28 END
```



2. Write an assembly language program using interrupts to do the following operations simultaneously: (a) Receive the data serially and send it to P1 (b) Have port P0 read and transmitted serially and a copy given to P2 (c) Make Timer 0 to generate a square wave of 3KHz frequency on P1.1. with 66.67% duty cycle. Assume that XTAL = 11.0592Mhz. Set the baud rate at 4800.

   Code:

```
ORG 0000H
MOV TMOD, #01H
MOV P1, #00H

MAIN_LOOP:
   SETB P1.0

   MOV TH0, #0FFH
   MOV TL0, #058H
   SETB TR0
WAIT_ON:
   JNB TF0, WAIT_ON
   CLR TR0
   CLR TF0

   CLR P1.0

   MOV TH0, #0FCH
   MOV TL0, #080H
   SETB TR0
WAIT_OFF:
   JNB TF0, WAIT_OFF
   CLR TR0
   CLR TF0
```

```
    SJMP MAIN_LOOP

END
```