

Task 5

6 × 2 = 10 marks

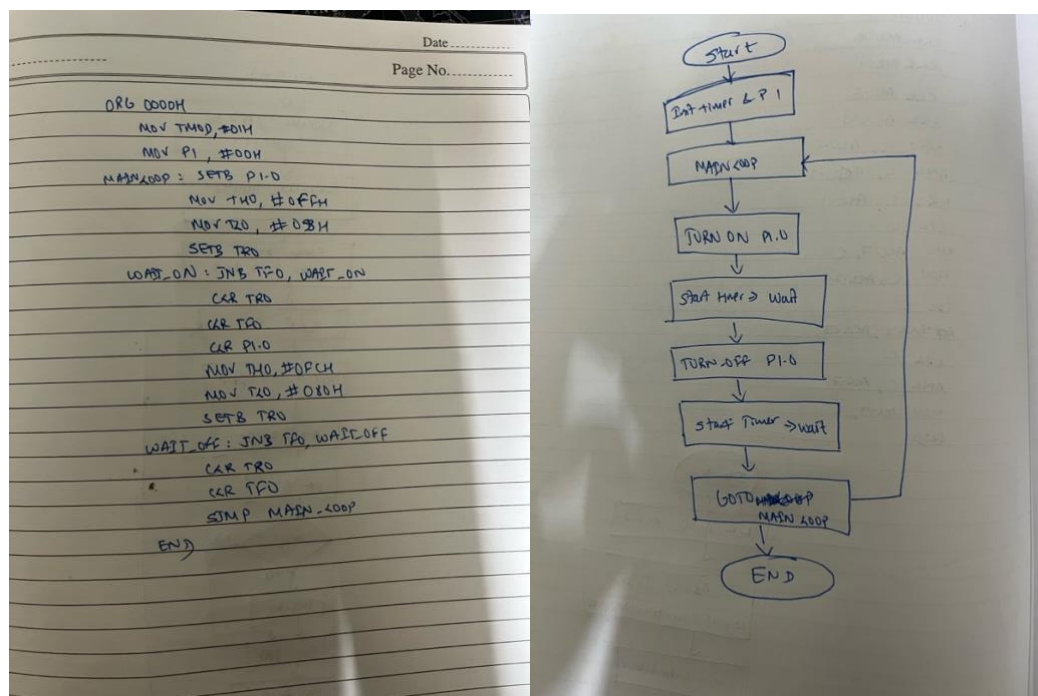
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Each question carries six marks.

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

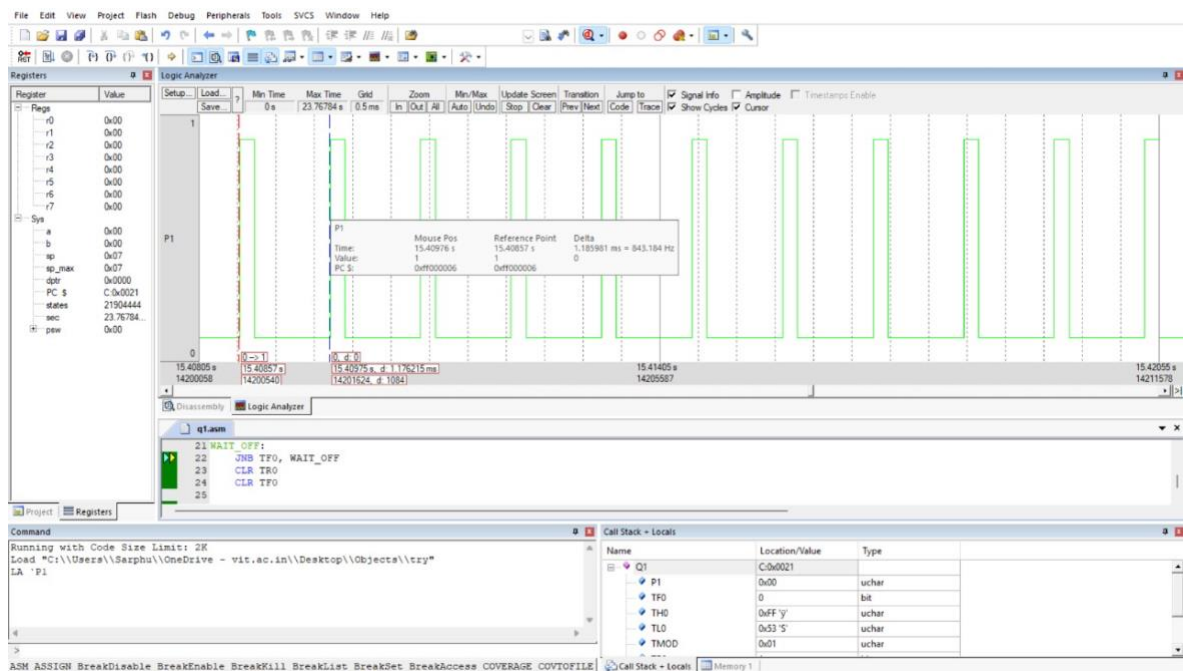
SJMP MAIN_LOOP

END

```

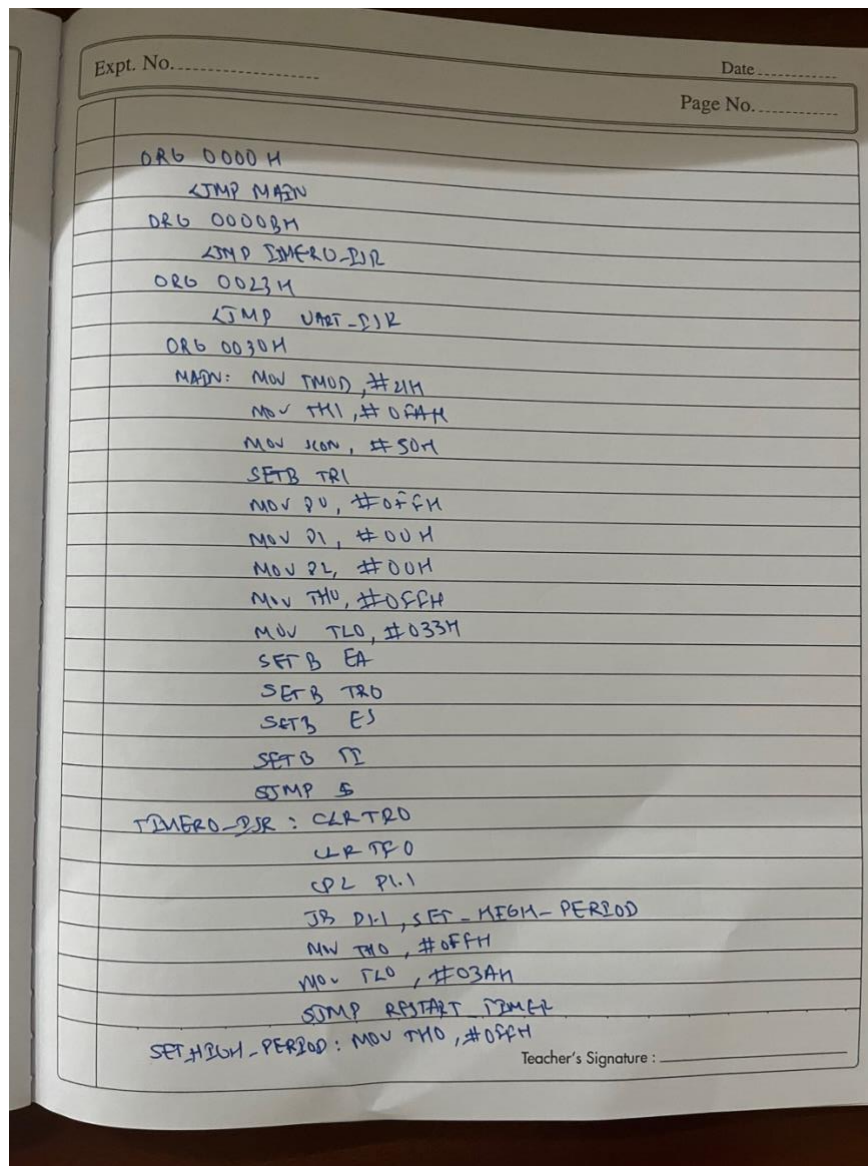
q1.asm
1 ORG 0000H
2 MOV TMOD, #01H
3 MOV P1, #00H
4
5 MAIN_LOOP:
6     SETB P1.0
7
8     MOV TH0, #0FFH
9     MOV TL0, #058H
10    SETB TR0
11 WAIT_ON:
12    JNB TF0, WAIT_ON
13    CLR TR0
14    CLR TF0
15
16    CLR P1.0
17
18    MOV TH0, #0FCH
19    MOV TL0, #080H
20    SETB TR0
21 WAIT_OFF:
22    JNB TF0, WAIT_OFF
23    CLR TR0
24    CLR TF0
25
26    SJMP MAIN_LOOP
27
28 END

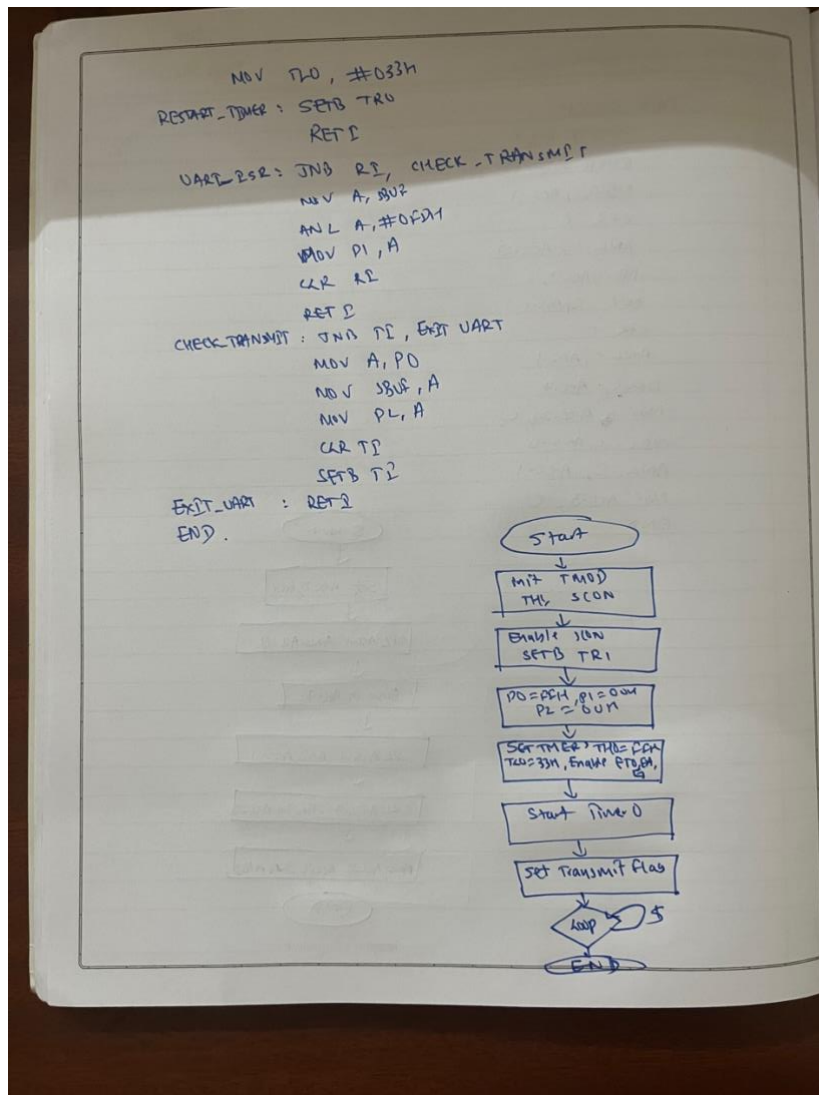
```



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.

Handwritten code and flowchart





Code and Output:

```

33 RET HIGH PRIORITY
34 MOV TMO, #0FH
35 MOV TLO, #033H
36 RESTART_TIMER:
37 SETB TR0
38 RETI
39 UART_ISR:
40 JNB RI, CHECK_TRANSMIT
41 MOV A, SBUF
42 ANL A, #0FH
43 MOV P1, A
44 CLR RI
45 RETI
46 CHECK_TRANSMIT:
47 JNB TI, EXIT_UART
48 MOV A, P0
49 MOV SBUF, A
50 MOV P1, A
51 CLR TI
52 SETB TI
53 EXIT_UART:
54 RETI
55 END

```

Parallel Port 0

Port 0: 7 Bits 0

P0: 0x05

Pins: 0x05

Parallel Port 1

Port 1: 7 Bits 0

P1: 0x00

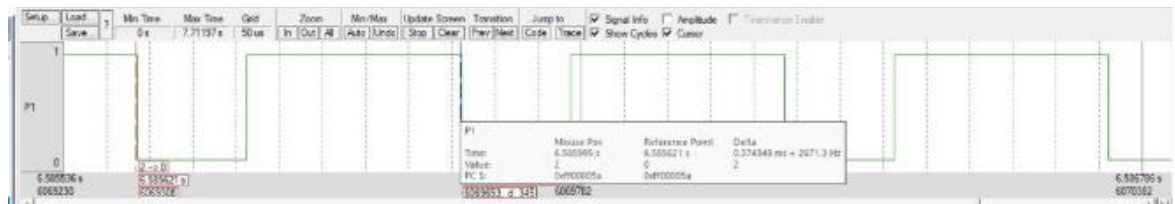
Pins: 0x00

Parallel Port 2

Port 2: 7 Bits 0

P2: 0x05

Pins: 0x05



```

ORG 0000H
LJMP MAIN
ORG 000BH
LJMP TIMER0_ISR
ORG 0023H
LJMP UART_ISR
ORG 0030H
MAIN:
MOV TMOD, #21H
MOV TH1, #0FAH
MOV SCON, #50H
SETB TR1
MOV P0, #0FFH
MOV P1, #00H
MOV P2, #00H
MOV TH0, #0FFH
MOV TL0, #033H
SETB ET0
SETB EA
SETB TR0
SETB ES
SETB TI
SJMP $
TIMER0_ISR:
CLR TR0
CLR TF0
CPL P1.1
JB P1.1, SET_HIGH_PERIOD
MOV TH0, #0FFH
MOV TL0, #09AH
SJMP RESTART_TIMER
SET_HIGH_PERIOD:
MOV TH0, #0FFH
MOV TL0, #033H
RESTART_TIMER:
SETB TR0RETI
UART_ISR:
JNB RI, CHECK_TRANSMIT
MOV A, SBUF
ANL A, #0FDH
MOV P1, A
CLR RI
RETI
CHECK_TRANSMIT:
JNB TI, EXIT_UART
MOV A, P0
MOV SBUF, A
MOV P2, A
CLR TI

```

```
SETB TI  
EXIT_UART:  
RETI  
END
```