

Task 3

6 × 2 = 12 marks

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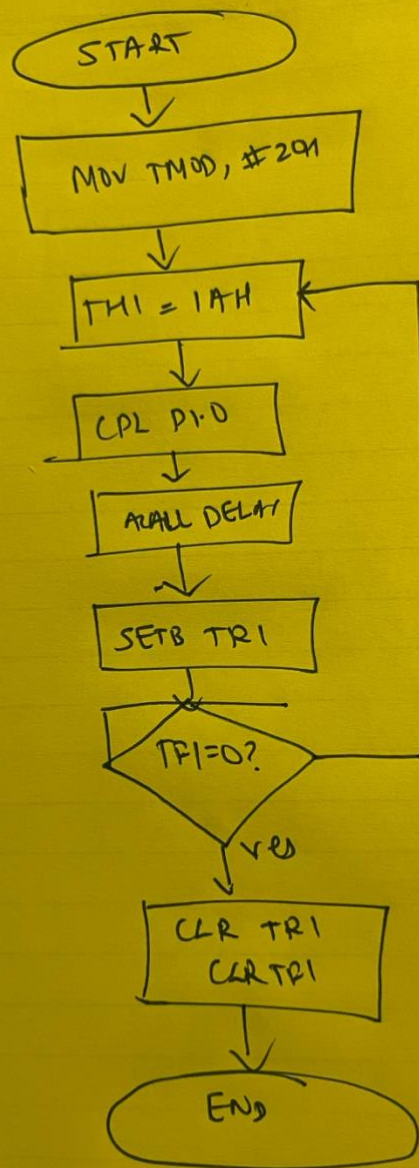
Each question carries six marks.

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

1. Write a program using timer 1 to generate a 2 KHz square wave frequency on one of the pins of P1.0. (MODE2). Then examine the frequency using the KEIL IDE inbuilt Logic Analyzer.

Handwritten Code and Flowchart

```
ORG 0000H
MOV TMOD, #20H
HERE: MOV TL1, #1AH
MOV TH1, #0FFH
CLR P1.0
ACALL DELAY
SJMP HERE
DELAY: SETB TR1
AGAIN: JNB TF1, AGAIN
CLR TR1
CLR TF1
RET
END
```



Snapshot of program and output:

ORG 000DH

MOV TMOD, #20H

HERE:

MOV TL1, #1AH

MOV TH1, #0FFH

CPL P1.0

ACALL DELAY

SJMP HERE

DELAY:

SETB TR1

AGAIN:

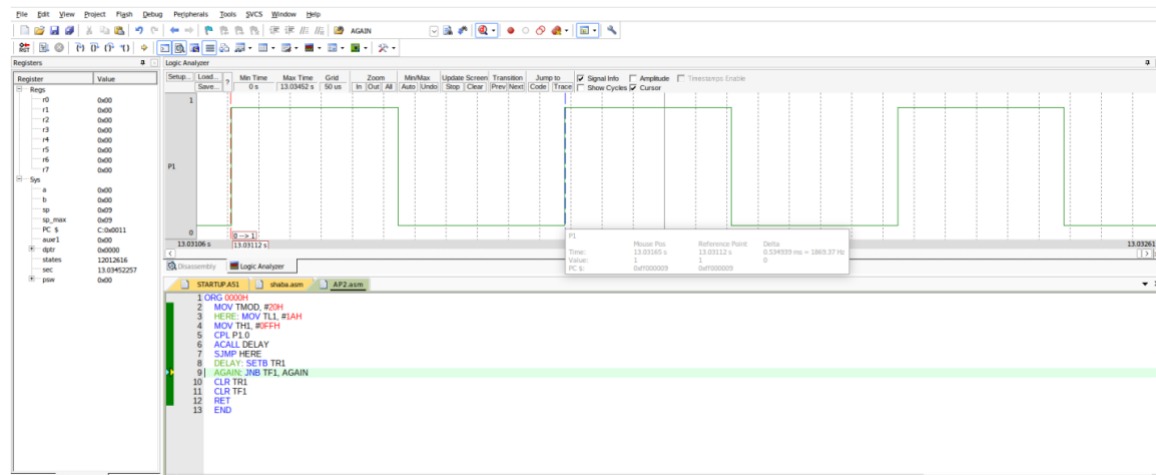
JNB TF1, AGAIN

CLR TR1

CLR TF1

RET

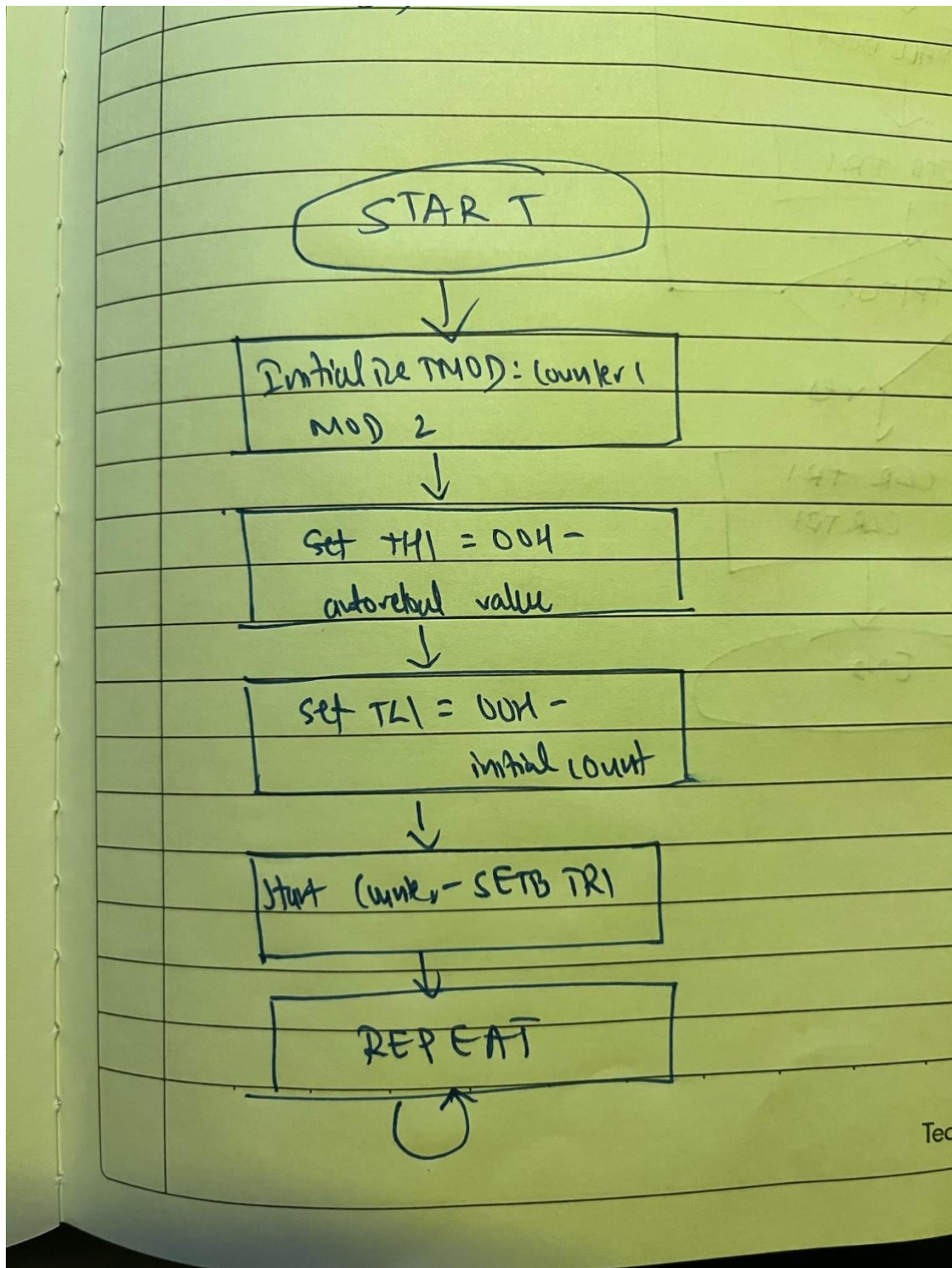
END



- Assuming that clock pulses are fed into pin T1, write a program for counter 1 in mode 2 to count the pulses and display the state of the TL1 count on P2, which connects to 8 LEDs.

Handwritten code and flowchart:

```
ORG 0000H  
MOV TMOD, # 01100000B  
MOV TH1, # 00H  
MOV TL1, # 00H  
SETB TR1  
MAIN:  
    MOV D2, TL1  
    SJMP MAIN  
END
```

Typed program and output:

ORG 0000H

MOV TMOD, #01100000B

MOV TH1, #00H

MOV TL1, #00H

SETB TR1

MAIN:

MOV P2, TL1

SJMP MAIN

END

The screenshot displays a logic analyzer interface with the following components:

- Assembly Code Window:** Shows the following code:

```
1 ORG 0000H
2 MOV TMOD, #01100000B
3 MOV TH1, #00H
4 MOV TL1, #00H
5 SETB TR1
6 MAIN:
7 MOV P2, TL1
8 SJMP MAIN
9 END
```
- Registers Window:** Lists registers r0-r7, SFRs SP, PC, ACC, and STATUS. Values are mostly 0x00, with PC at 0x000E and STATUS at 0x15465.
- Logic Analyzer Waveform:** Shows a timeline with two pop-up windows for "Parallel Port 2" and "Parallel Port 3". Both show data at 0x00.
- Command Window:** Contains the command: `Load "C:\Users\dsapshu\OneDrive - vit.ac.in\Desktop\Objects\Apurba\great" LA (P1 & 0x00000001) LA (P1 & 0x00000001)`
- Memory Window:** Shows memory addresses starting from 0x2004, with data values of 0x00.