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SCHOOL OF ELECTRONICS ENGINEERING (SENSE)

Continuous Assessment Test – II
Winter Semester -2022-23

Programme Name & Branch : B.Tech ECE

Course Name & Code : BECE204L- Microprocessors and Microcontrollers

Slot: C1 Answer all the questions Exam Duration:50 Minutes

S.No	Question	Marks
1.	Write an 8051 assembly language program to toggle P2.3 every 225 micro secs, use Timer1 for the delay creation, assume XTAL = 11.0592 MHz.	10
2.	Write an 8051 assembly language program to receive data serially, check the LSB bit of the received data, if it is 0, send the received data to Port P1, else send the received data to Port P2, use 2400 as the baudrate, assume XTAL=11.0592 MHz.	10
3.	Write an 8051 assembly language program to get the data from Port P0 and send it to Port P1 continuously, while the interrupts will do the following, assume XTAL = 11.0592 MHz (a) Keep transmitting the data 'VIT' continuously through the serial COM port with 2400 baudrate. (b) Whenever there is a falling edge at P3.3 (INT1 pin), turn on the buzzer at P1.4 for some time.	10
4.	Write an 8051 assembly language program to use Timer 0 as a counter in mode 2, show the state of the counter in Port P2, whenever the counter rolls over increment the value in Port P1. Assume XTAL = 11.0592 MHz	10
5.	Assume a switch is connected to P2.4, write an 8051 assembly program to monitor the status of the switch, if the switch is ON (logic 1), then generate a square wave of 2 KHz at P2.1, else generate a square wave of 5 KHz at P2.7, use XTAL = 12 MHz.	10

1. Write an 8051 assembly language program to toggle P2.3 every 225 micro secs, use timer 1 for the delay creation, assume XTAL = 11.0592 MHz

A: Time delay = 225 μsec

Number of Machine cycles = $\frac{225\ \mu sec}{1.085\ \mu sec}$

= 207 & 208

256
208
48

```
        ORG   0000H
        MOV   TMOD, #20H
        MOV   TH1, #-208 & 30h
L1:     CPL   P2.3
        ACALL DELAY
        SJMP  L1
DELAY:  SETB  TR1
L2:     JNB   TF1, L2
        CLR   TR1
        CLR   TF1
        RET
        END.
```

2. Write an 8051 assembly language program to receive data serially. Check the LSB bit of the received data, if it is 0, send the received data to Port P1, else send the received data to Port P2, Use 2400 as the baudrate, assume XTAL = 11.0592MHz

Ans

$$\frac{28800\ Hz}{2400} = 12$$

```
        ORG   0000H
        MOV   TMOD, #20H
        MOV   SCON, #50H
        MOV   TH1, #-12
        SETB  TR1
L1:     JNB   RI, L1
        CLR   RI
        MOV   A, SBUF
        CLR   RI
        JNB   ACC.0, L2
        MOV   P2, A
        SJMP  L1
L2:     MOV   P1, A
        SJMP  L1
        END
```

3. Write an 8051 assembly language program to get the data from Port P0 and send it to Port P1 continuously, while the interrupts will do the following, assume XTAL = 11.0592 MHZ

a. keep transmitting the 'VIT' continuously through the Serial COM port with 2400 baudrate.

b. whenever there is a falling edge at P3.3 (INT1 Pin) turn on the buzzer at P1.4 for some time

$\frac{28800}{2400} = 12 \Rightarrow$ value to be loaded in TH1 = -12.

```
        ORG   0000H
        LJMP  Main
        ORG   0013 H
        LJMP  INT
        ORG   0023 H
        LJMP  SERIAL
Main:   MOV   P0, # 0FFH
        SETB  TCON.2
        MOV   TMOD, # 20H
        MOV   IE, # 10010100B
        MOV   TH1, # -12
        SETB  TR1
```

```
BACK:   MOV DPTR, #MYDATA
        MOV R1, #03
AGAIN:  CLR A
        MOVC A, @A+DPTR
        MOV SBUF, A
        INC DPTR
        MOV P1, P0
        DJNZ R1, AGAIN
        SJMP BACK

INT:    SETB P3.3
        MOV R3, #255
BACK1:  DJNZ R3, BACK1
        CLR P3.3
        RETI

SERIAL: JB TI, TRANS
        MOV A, SBUF
        CLR RI
        RETI
TRANS:  CLR TI
        RETI

MYDATA: DB 'VIT'
        END
```

4. Write an 8051 assembly language program to use Timer 0 as a Counter in mode 2, show the state of the Counter in PortP2, whenever the Counter rolls over increment the value in Port P1
Assume XTAL = 11.0592 MHz

Ans:

```
        ORG     0000H
        MOV TMOD , #00000110B
        MOV     TH0 , #0
        MOV     R1, #0
        SETB    P3.4
AGAIN:  SETB    TR0
BACK:   MOV     A, TL0
        MOV     P2 , A
        JNB     TF0, BACK
        CLR TR0
        MOV     A, R1
        INC     A
        MOV     P1, A
        MOV     R1, A
        CLR TF0
        SJMP    AGAIN
        END.
```

5. Assume a Switch is Connected to P2.4, write an 8051 assembly program to monitor the State of the switch, if Switch is ON Then generate a Square wave of 2KHz at P2.1, else generate a Square wave of 5KHz at P2.7, use XTAL = 12MHz

Ans:

$T_1 = \frac{1}{2KHz}$

$T_1 = 500\ \mu sec$

No. of Machine Cycles = 500

No of Machine cycles for half cycle = 250

$T_2 = \frac{1}{5KHz}$

$T_2 = 200\ \mu sec$

No of Machine cycles = 200

No of Machine cycles for half cycle = 100

```
ORG 0000H
SETB P2.4
MOV TMOD, #22H
MOV TH0, #-250
MOV TH1, #-100
```

```
L1:   JNB   P2.4, L2
      CPL   P2.1
      SETB  TR0
L3:   JNB   TF0, L3
      CLR   TR0
      CLR   TF0
      SJMP  L1

L2:   CPL   P2.7
      SETB  TR1
L4:   JNB   TF1, L4
      CLR   TR1
      CLR   TF1
      SJMP  L1

      END
```