

Please check that this question paper contains 09 questions and 02 printed pages within first ten minutes.

[Total No. of Questions: 09]

EVENING

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Uni. Roll No. .... 31 DEC 2022

Program: B.Tech. EE (Sem. 5<sup>th</sup>)(Scheme 2018)  
MICROPROCESSORS and MICROCONTROLLERS

Subject Code: PCEE-III

Paper ID:16463

Scientific Calculator is allowed

Time Allowed: 03 Hours

Max. Marks: 60

Note:

- 1) Parts A and B are compulsory
- 2) Part C has two questions Q8 and Q9. Both are compulsory, but with internal choice.
- 3) Any missing data may be assumed appropriately

Part – A

[ Marks: 02 each]

Q1.

- a) Name different types of buses used in 8051 microcontroller. Mention which of them is unidirectional and bidirectional.
- b) An SSD memory has a capacity of 2 TB. How many bytes of data it can store.
- c) DS 12887 supports which clock modes?
- d) Find the number of times the loop is performed.  
MOV R0,#250  
AGAIN: MOV R3, #50  
HERE: DJNZ R0, HERE  
DJNZ R2, AGAIN
- e) Write the instructions to do the following:
  - a) Make the lower nibble of R1, the high nibble.
  - b) Get the result of ORing 0A5H OR 23H
- f) What is step size (resolution)? What will be the step size of 8 bit ADC if all bits are '1' for analog input of 5V?

Part – B

[ Marks: 04 each]

- Q2. What is the role of PSW register in 8051? Explain each bit of PSW register.
- Q3. Write a program to multiply 25H by 10H using repeated addition method.
- Q4. What is meant by addressing modes in 8051 microcontroller? Illustrate any **four** different types of addressing modes; briefly explain them by giving one example for each.
- Q5. Explain internal memory organization of RAM in 8051 $\mu$ C.

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- Q6. How many interrupts does 8051 have? How they are activated?
- Q7. State difference between bit rate and baud rate. What is the role of the SBUF register in serial data transfer?

Part – C

[Marks: 12 each]

- Q8. Draw the connection diagram of 16X2 LCD with 8051. Explain the role of each pin of LCD.

OR

Draw and explain the architecture 8051.

- Q9. In the following program, we are creating a square wave of 50% duty cycle (with equal portions HIGH and LOW) on P1.0bit. Timer 0 is used to generate the time delay. Analyze the program Calculate the time delay and also mention the steps to program in this mode. XTAL=11.0592MHz

```
HERE:      MOV      TMOD, #01
           MOV      TLO, #0F0H
           MOV      TH0, #0FFH
           CPL      P1.0
           ACALL   DELAY
           SJMP    HERE

DELAY:

AGAIN:     SETB    TRO
           JNB     TFO, AGAIN

           CLR     TRO
           CLR     TFO
           RET
```

OR

Draw the 8051 connection to ADC 0804 with clock from XTAL 2 of the 8051. Justify why D-Flip Flops are used and mention the steps or draw the timing diagram to get data from an ADC0808/0809

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