Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

Semester : Semester IV - 2021
Course Code : EEE3051
Course Name : Sem IV - EEE3051 - Microcontroller Applications
Program : ISR

Date : 9-JUN-2023
Time : 9.30AM - 12.30PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. Explain the mode 2 of 8051 timer.

(CO3) [Knowledge]

2. Define sensor and actuator with proper examples.

(CO4) [Knowledge]

3. Explain direct and register indirect addressing mode with suitable examples.

(CO2) [Knowledge]

4. Differentiate between microprocessor and microcontroller.

(CO1) [Knowledge]

5. Draw the control circuit of 8051 timer.

(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(5 X 10 = 50M)**

6. Write a program to create a square wave of 50% duty cycle (with equal portions high and low) on the PI.5 bit. Use Timer 0 to generate the time delay and also, show the calculation to produce a delay in 8051.

(CO3) [Comprehension]

7. Write an assembly language program to convert packed BCD to two ASCII numbers. Also write the comment for each of the 8051 instructions and explain the flow of the program with output. (Assume packed BCD number as: 76)

(CO3) [Comprehension]

8. Many colleges and universities are implementing Internet of Things (IoT) technologies to help improve safety, boost student experiences, facilitate parking and even enhancing service in dining halls. Connected devices on campus collect data that can be used to improve teaching and personalize learning. And smart technologies also can help institutions save energy – and money – by using networked sensors and data analytics that optimize systems across campus. Kindly propose any Iot application feasible for the college campus which helps to enhance the experience of the students and faculties. Also draw the diagram for a better understanding of the idea.

(CO4) [Comprehension]

9. Write a program to (a) load the accumulator with the value 55H and (b) complement the accumulator 700 times. Also, write the comments for each of the 8051 instructions.

(CO2) [Comprehension]

10. Mr. Kailash wants to write a program for adding two 16 bit numbers. He has started the program and forgot the logic of the program. Kindly help him to complete the program with the comments for each of the instructions. Also, show the output of the program.

```
MOV R0, #24H //LOWER NIBBLE OF NO.1
MOV R1, #11H //HIGHER NIBBLE OF NO.1
MOV R2, #0BCH //LOWER NIBBLE OF NO.2
MOV R3, #0CEH //HIGHER NIBBLE OF NO.2
CLR C
.....
```

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 20 = 40M)**

11. Draw the flow chart to subtract two 16 bit numbers and write the program with comments for each of the 8051 instructions. Also, perform the operation of subtraction on two 16 bit numbers and write the ouitput of the program (Assume two 16 bit numbers as: CDAB H and 3412 H).

(CO2) [Application]

12. Write an assembly language program to create a delay of 50 ms ON time 50 ms OFF time, followed by five repetitions of 10 ms on time and 10 ms OFF time. To generate a delay of 50 ms, a 10 ms delay is repated 5 times.

(CO3) [Application]