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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

**MAKE UP EXAMINATION - JULY 2024**

**Course Code :** EEE3051

**Course Name :**  Microcontroller Applications

**Program :** B.Tech. Computer Science and Engineering

**Date :** 19-07-2024

**Time :** 1:30 PM - 4:30 PM

# Max Marks : 100

**Weightage :** 50%

# Instructions:

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *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 Internet of Things with a proper example.
2. Draw the format of 8051 RAM with address location.
3. Explain timer and counter operation in 8051.
4. Draw the format of program status word (PSW) in 8051.

(CO4) [Knowledge] (CO2) [Knowledge] (CO3) [Knowledge] (CO1) [Knowledge]

1. Draw the format of TMOD register in 8051 and find the value of TMOD register to operate timer 0 in mode 1.

(CO3) [Knowledge]

 **PART B**

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

1. Mr. Ratnesh is writing an assembly language program for finding the largest element in a given string of N=4 bytes at location 8200h. He forgots to add loop in the program. Kindly help him to add loop at the suitable place to complete the program and also, write the comment for each of the instructions.

ORG 00H MOV R2, #04H

MOV DPTR, #8200H MOVX A, @DPTR DEC R2

MOV R1, A

LOOP2: JNC LOOP1 MOV A, 30H LOOP1: MOV R1, A DJNZ R2, LOOP3 MOV 60H, A

END

(CO1) [Comprehension]

1. 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]

1. Mr. Shyam wants to generate a delay of 1 ms using mode 1 of Timer 0 register. Kindly help him by performing calculation to find the value of TH0 and TL0 to generate delay of 1 ms and then write a assembly language program by choosing the suitable register. .

(CO3) [Comprehension]

1. Write a program to (a) clear accumulator and then, (b) add 3 to the accumulator ten times. Also, speicify the comment for each of the instructions.

(CO2) [Comprehension]

1. IoT technology has been a driving force behind the development of smart cities since their inception. IoT technology will continue to grow as more countries adopt next-generation connectivity, and it will have a greater impact on our lives. Connected sensors, lights, and meters are some of the IoT devices in smart cities that collect and analyze data. As a result, cities use this data to improve infrastructure, utilities, and other city services. Discuss and explain any one real-time IoT scenario related to enhancing the infrastructure of smart cities. Also, draw the diagram for better illustration of the idea.

(CO4) [Comprehension]

**PART C**

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

1. 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]

1. Write an assembly language program to find the smallest element in a given string of N=4 bytes at location 8200h. Also write the comment for each of the 8051 instructions and draw the flow chart of the program.

(CO3) [Application]