PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - AUGUST 2024

Semester: IV	**Date :8-08-2024**
Course Code: EEE3051	**Time : 09.30am to 12.30pm**
Course Name: Microcontroller Applications	**Max Marks :100**
Program: B.Tech - ISE	**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 ANY 5 QUESTIONS	**5Q X 4M=20M**	
1	List out the various applications of Microcontroller	(CO1)	[Knowledge]
2	Microcontrollers are mainly used in small-scale applications like washing machines, cameras, security alarms, and keyboard controllers. Conversely, microprocessors are employed in personal computers, complex industrial controllers, traffic lights, defense systems, and other larger-scale systems. List the differences between microcontrollers and microprocessors?	(CO1)	[Knowledge]
3	List out the various types of addressing modes of 8051 with examples	(CO2)	[Knowledge]
4	Define the term Instruction Set of 8051? List out the various types of Instruction Sets giving one example for each.	(CO2)	[Knowledge]
5	Compare and contrast the concepts of interrupts and polling in the context of the 8051 microcontrollers. Define interrupt service routine (ISR) and explain its role in handling interrupts	(CO3)	[Knowledge]
6	Describe the functions and significance of the SBUF and SCON registers in facilitating serial communication in the 8051 microcontrollers. Explain how these registers are utilized in both transmitting and receiving data serially.	(CO3)	[Knowledge]
7	Define the term sensor and explain the role of sensors in IoT. Also, list the various types of sensors and their functions.	(CO4)	[Knowledge]

	PART B		
	ANSWER ANY 5 QUESTIONS	**5Q X 10M=50M**	
8	How many ports does the 8051 microcontrollers typically have? Name them and explain their functions.	(CO1)	[Comprehension]
9	The Decimal Adjust Accumulator (DAA) instruction is typically encountered in assembly language programming, particularly with processors that support binary-coded decimal (BCD) arithmetic. Explain with necessary examples the Decimal Adjust Accumulator (DAA) instruction.	(CO2)	[Comprehension]
10	Write a program to copy the value 55H into RAM memory locations 50H to 51H using; a. Direct addressing mode. and b. Register indirect addressing mode.	(CO2)	[Comprehension]
11	Explain the significance of the dB 9 pin connector in the context of the 8051 microcontroller. Describe the pin out configuration of the dB 9 connector and its typical usage scenarios in microcontroller-based systems.	(CO3)	[Comprehension]
12	Describe and discuss three diverse applications of Arduino microcontrollers in real-world scenarios, highlighting their significance and functionality in each case.	(CO4)	[Comprehension]
13	Identify and list the potential applications of Internet of Things applied to various fields.	(CO4)	[Comprehension]

	PART C		
	ANSWER ANY 2 QUESTIONS	**2Q X 15M=30M**	
14	An 8051 microcontroller is provided to you, and it has a string of four bytes saved in memory position 8100H. To determine which element in this string is the smallest, write an assembly language program. Keep the outcome in register A. Describe how your program finds the smallest element and explain each step in detail.	(CO2)	[Application]
15	With XTAL = 11.0592 MHz, Compute the TH1 value needed to have the following baud rates. (a) 9600 (b) 2400 (c) 1200 (d) 4800	(CO3)	[Application]
16	Discuss the implementation of IoT technology for efficient waste management in smart cities. Highlight the key components, such as sensors, data analytics, and communication protocols, and explain how they contribute to optimizing waste collection, sorting, and disposal processes. Additionally, analyze the potential benefits and challenges associated with integrating IoT solutions in urban waste management systems.	(CO4)	[Application]