U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: ES Cluster (EEE/ET/ECE/EIE/MD) **Duration: 3 hrs.**
Course Code: 19ES4CCMCS **Max Marks: 100**
Course: Microcontrollers

Instructions:1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	*CO*	*PO*	Marks
1	a)	Explain the characteristics of Embedded Systems	CO1	PO1	**05**
	b)	Compare Harvard and Von-neumann CPU architectures.	CO1	PO1	**05**
	c)	Depict the internal block diagram of 8051 and explain the function of each block.	CO1	PO1	**10**
		UNIT - II			
2	a)	Explain each following instructions and write output after execution of each of the instructions two times, assume CY = 1 and A=36H for all cases i) RR A ii) RLC A iii) RRC A iv) RL A	CO1	PO2	**06**
	b)	What are assembler directives? Explain the functions of assembler directives DB, EQU, END and ORG?	CO2	PO2	**06**
	c)	What is the difference between Jump and Call instructions? Mention different types of Jump instructions and explain with instructions.	CO2	PO2	**08**
		OR			
3	a)	Explain the different addressing modes of 8051 with example.	CO1	PO2	**10**
	b)	Write a Program to check whether given number is palindrome or not. If palindrome store FFH in accumulator else store 00H in accumulator.	CO3	PO2	**04**
	c)	Differentiate between the following instructions with example a)MOVX and MOVC b) SWAP and XCHD c) SJMP and LJMP	CO3	PO3	**06**
		UNIT - III			
4	a)	Explain the steps to program timers of 8051 in mode 2	CO4	PO3	**05**

		b)	Write an ALP to send the message "The Earth is but one Country" to serial port, assuming that Switch is connected to P1.2. Monitor its status and decide as follows. SW = 0: "ON SWITCH", 4800 baud rate SW = 1: "OFF SWITCH" 9600 baud rate Assume XTAL = 11.0592MHz, 8-bit data and 1 stop bit	CO4	PO3	**10**
		c)	Write an 8051 C program to generate a square wave of 50% duty cycle (with equal portions high and low) on the P1.5 bit. Timer 0 is used to generate the time delay. Analyse the program. Also calculate the delay generated. Assume XTAL=11.0592MHz.	CO4	PO3	**05**
			OR			
	5	a)	Outline the advantages of coding 8051 in C instead of assembly.	CO3	PO2	**06**
		b)	Write an 8051-assembly language program to create a pulse width of 5ms on port 2.3 using timer 0 in Mode-1. Determine the timer count. Assume a crystal frequency of 11.0592MHz.	CO4	PO3	**07**
		c)	Write a Program to receive bytes of data serially, and put them in P2, set the baud rate at 9600, 8-bit data, and 1 stop bit.	CO4	PO2	**07**
			UNIT - IV			
	6	a)	The word "BMS" has been burned in the external data ROM location starting from 4100h, write a program to read this data into data RAM locations of an 8051 starting from 60h.	CO3	PO2	**10**
		b)	How External ROM is interfaced with 8051 microcontroller?	CO3	PO2	**10**
			UNIT - V			
	7	a)	Explain DC motor interfacing with 8051 using a Darlington and MOSFET transistor.	CO5	PO1	**10**
		b)	Write an 8051 C program to send letters 'M', 'D' and 'E' to the LCD using delays.	CO5	PO2	**10**

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