U.S.N.										

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

Autonomous Institute Affiliated to VTU

July / August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: ES Cluster **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)		Difference between Harvard and Von-Neumann architecture with diagrams.	*CO1*	*PO1*	**05**
	b)		With the block diagram, explain the architecture of 8051.	*CO1*	*PO1*	**10**
	c)		Discuss the need for stack memory in microcontrollers. How the stack is operated in 8051.	*CO1*	*PO1*	**05**
			UNIT - II			
2	a)		Explain the different addressing modes of 8051 with example.	*CO1*	*PO2*	**08**
	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*	**06**
			OR			
3	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)		Write an ALP to convert the given two digit BCD number to binary and display the value at PORT0.	*CO3*	*PO2*	**08**
	c)		Differentiate between the following instructions with example 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 of width 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)	How External ROM is interfaced with 8051 microcontroller?	*CO3*	*PO2*	**10**
		b)	The word "HAPPY" 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**
			UNIT - V			
	7	a)	Write an 8051 C program to send letters 'M', 'D' and 'E' to the LCD using delays.	*CO5*	*P02*	**10**
		b)	Explain DC motor interfacing with 8051 using a Darlington and MOSFET transistor.	*CO5*	*P01*	**10**

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