Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

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Fourth Semester B.E. Degree Examination

Subject Title: MICROCONTROLLER

TIME: 03 Hours **Max. Marks: 100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		Module -1	*Bloom's Taxonomy Level	Marks
Q.01	a	With neat block diagram explain features of microcontroller 8051.	L1	8
	b	Write a note on Embedded microcontrollers.	L1	4
	c	Write an interfacing diagram 8051 microcontroller interfaced to 8k bytes of ROM and 8k bytes of RAM.	L2	8
		OR		
Q.02	a	With neat diagram explain the internal memory structure and programming model of 8051 microcontroller.	L1	8
	b	Write a short not criteria for choosing a microcontroller.	L1	4
	c	Write an interfacing diagram 8051 microcontroller interfaced to 8k bytes of ROM and 16k bytes of RAM.	L2	8
		Module-2		
Q. 03	a	With neat diagram explain the bit contents of PWS.	L1	4
	b	Write a note on branching instructions defining their range.	L2	8
	c	Write an assembly language program to add two 16 bit numbers loaded in R1R0 and R3R2. Store the result in R6, R5 and R4 from MSB to LSB.	L3	8
		OR		
Q.04	a	Write a note on bit manipulation instructions.	L1	4
	b	Explain how the instructions work: 1. `JMP @A+DPTR` 2. `XCHD A, @Ri` 3. `JBC bit, rel8` 4. `MOVC A, @A+PC`	L2	8
	c	Write an assembly language program to multiply a 16 bit number loaded in R1R0 (multiplicand) with an 8-bit number loaded in R2 (multiplier). Store the resultant product in R6, R5 and R4 from MSB to LSB.	L3	8
		Module-3		
Q. 05	a	Explain PUSH and POP instructions with a help of example program.	L2	4
	b	3 eight bit numbers X, NUM1 and NUM2 are stored in internal data RAM locations 20h, 21h and 22H respectively. Write an assembly language program to compute the following: IF X=0; then NUM1 (AND) NUM2,	L3	8

		IF X=1; then NUM1 (OR) NUM2, IF X=2; then NUM1 (XOR) NUM2, ELSE RES =00, RES is 23H RAM location.		
	c	Write a assemble language program to toggle all the bits of Port 2 for every 200ms. Assume crystal is 11.0592MHz. Show all the calculations needed.	L3	8
		OR		
Q. 06	a	Explain why pull-up resistors are connected to Port 0.	L2	4
	b	Write an assembly language program to find the factorial of a number. Use Subroutine programming.	L3	8
	c	Write an assembly language program to find the average of 10 students marks stored in external RAM memory address 8000H. Load the average value in internal RAM memory 30H.	L3	8
		Module-4		
Q. 07	a	Explain RS232 standard and 9 pin DB connector.	L1	4
	b	Explain the mode 2 operation of timers and mention the steps involved in programming timers in mode 2.	L2	8
	c	Write a C program for the 8051 to transfer "YES" serially at 9600 baud, 8-bit data, 1 stop bit, do this continuously.	L3	8
		OR		
Q. 08	a	Explain the importance of MAX232 IC with its pin details.	L1	4
	b	Explain how timers are used as counters, explain the counters operation using a code snippet.	L2	8
	c	Assume XTAL = 11.0592 MHz, write a assembly language program to generate a square wave of 50 kHz frequency on pin P2.3.	L3	8
		Module-5		
Q. 09	a	Explain the Interrupt Vector Table of 8051 microcontroller.	L1	5
	b	Explain how multiple interrupts are handled in 8051 microcontroller.	L2	5
	c	With neat diagram write an assembly language program to interface LCD to 8051 microcontroller.	L3	10
		OR		
Q. 10	a	List the steps involved in executing interrupts in 8051 microcontroller.	L1	5
	b	Explain how interrupt programming is done using C programming in 8051 microcontroller.	L2	5
	c	With neat diagram write an assembly language program to interface Stepper motor to 8051 microcontroller.	L3	10

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.