Model Question Paper-2 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 a neat diagram explain the architectural features of 8051 microcontroller.	L1	8
	b	Bring out the difference between Microprocessor and Microcontroller.	L1	4
	c	With diagrams explain the internal RAM structure of 8051 microcontroller.	L2	8
		OR		
Q.02	a	With simple block diagram explain the features of 8051 microcontroller.	L1	8
	b	Define microcontroller, mention its applications.	L1	4
	c	Interface 4k bytes RAM and 8k bytes ROM to 8051 microcontroller in such a way that starting address of RAM is 1000H and ROM is C000H.	L2	8
		Module-2		
Q. 03	a	Explain 5 different addressing modes with examples.	L1	8

	b	Check the correctness of the following instruction. If wrong correct them:
		    1. CJNE @RI, #D_ADDRESS, REL8
		    2. ADDC @RI, A
		    3. DJNZ #DATA, REL8
		    4. MOVX @DPTR, R1
			L2	8

	c	Write an ALP to convert a packed BCD number into two ASCII numbers. Store the result in R5 and R6 respectively.	L3	4
		OR		
Q.04	a	Define assembler directives. With example explain all the assembler directives supported by 8051 microcontroller.	L1	8

	b	Explain the following instructions, also mention how many bytes it takes to store in ROM:
		    1. DJNZ Rn, R_ADDRESS
		    2. JNC R_ADDRESS
		    3. DA A
		    4. MOVX A, @A+<BASE-REG>
			L2	8

	c	Write an ALP to convert a Binary number to packed BCD number (hexadecimal to decimal). The binary number is stored at 40h location. Store the converted packed BCD number at 50h and 51h internal RAM location.	L3	4
		Module-3		

Q. 05	a	With diagrammatical representation explain how stacks plays its role in subroutine operations.	L1	4
	b	Write an assembly language program to sort an array of n= 5 bytes of data in ascending order stored from location 30h. (Use bubble sort algorithm)	L3	8
	c	Write an assembly language program to count the number of 1's and 0's in an 8-bit data received from port P1. Store the count of 1's and 0's in 30h and 31h.	L3	8
OR
Q. 06	a	Write a note on subroutine instructions.	L1	4
	b	Write an assembly language program to sort an array of n= 5 bytes of data in descending order stored from location 30h. (Use bubble sort algorithm)	L3	8
	c	Assume a push button switch is connected to port pin P1.2, Write an assembly language program to monitor the switch and turn ON the LED's connected to port P2 as long as the switch is pushed.	L3	8
Module-4
Q. 07	a	Explain the bit contents of TCON and TMOD registers.	L1	8
	b	Write an assembly language program to transfer multi-byte data serially with 9600 baud rate.	L3	8
	c	Explain how timers are programed in mode 1.	L2	4
OR
Q. 08	a	Explain the bit contents of SCON and PCON registers.	L1	8
	b	Write an assembly language program to generate a square wave on port pin P1.2 of frequency 5k Hz.	L3	8
	c	Write a note on Asynchronous serial communication and data framing.	L2	4
Module-5
Q. 09	a	Explain the bit contents of IE register.	L1	4
	b	Explain how programming of external hardware interrupts is done in 8051 microcontrollers with a code snippet.	L2	6
	c	With neat diagram write an assembly language program to interface DAC to 8051 microcontroller.	L3	10
OR
Q. 10	a	Explain how interrupt priority can be changed using IP register. Also explain the default priorities assigned to interrupts in 8051 microcontroller.	L1	5
	b	Write a C program using interrupts to generate a square wave on port pin P1.2 of 1kHz using timer-0 in mode 2.	L2	5
	c	With neat diagram write an assembly language program to interface ADC-0804 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.