Model Question Paper-1/2 with effect from 2022-23 (CBCS Scheme)

USN | | | | | | | | | | |

Fourth Semester B.E. Degree Examination

Subject Title MICROCONTROLLERS

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

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02. Include suitable comments to your program

		Module -1	*Bloom's Taxonomy Level	Marks
Q.01	a	What are the differences between microcontrollers and microprocessors	L1	5
	b	Compare RISC and CISC systems.	L1	5
	c	Draw the architecture of 8051 micro controller and explain the following blocks (a)Program counter and data pointer (b)Accumulator, Register B and CPU registers (c) Stack and stack pointer	L2	10
		OR		
Q.02	a	Calculate the memory map of AT89C51 microcontroller with 4 KB of on chip ROM .	L2	5
	b	Explain the working of flag and PSW register . What is the status of PSW after adding (i) 67H with 72H (ii)55H with 88H	L2	10
	c	Explain the functions of EA and ALE pin .	L1	5
		Module-2		
Q. 03	a	Define assembler directive and explain the working of ORG 100 and ORG 100H directive.	L1	5
	b	20 hex numbers are stored in RAM locations 60H onwards. Write a program to find the smallest number in the set and save the result in RAM location 90H.	L3	10
	c	Explain the working of SUBB instruction when BORROW =0 and BORROW=1.	L2	5
		OR		
Q.04	a	Explain the conflict between stack and bank 1 and how this can be avoided.	L2	5
	b	RAM locations 50H-59H contain daily temperature readings for ten days , if any one of the value is 33H, write a program to give its location to registrar R0,else make R0=0.	L4	10
	c	Write a program to select bank 2 and load the value 89H in the registers R0-R7.	L2	5
		Module-3		
Q. 05	a	Explain the difference between unsigned and signed *char* and *int* declarations in 8051 C. Give examples.	L2	5
	b	Write 8051 C program to toggle all the bits of P0 and P1 with 100 mS delay. Use	L3	10

		EX-OR operator.		
	c	Explain different types of logic operations in 8051C.	L1	5
		OR		
Q. 06	a	Explain the bit status of TMOD register.	L1	5
	b	Write 8051 program to generate 50 KHz on the pin 2.5. Use timer 1 in mode 1 and assume XTAL =22 MHz .Show the count calculations.	L4	10
	c	Calculate the values of TMOD for the following modes (i)Mode-1 for timer 1 and Timer 0 (ii) Mode 2 for timer 1 and timer 0	L1	5
		Module-4		
Q. 07	a	Explain the bit status of SCON register.	L1	5
	b	Write 8051C program to send the message 'VTU' serially at 9600 baud rate and do it continuously. Assume 8 bit data with 1 stop and 1 start bit. Show the calculations of TMOD,TH1and SCON	L4	10
	c	With XTAL=22MHz, calculate the TH1 value for the following baud rates (i)1200 (ii)2400	L1	5
Q. 08	a	Compare interrupts with Polling methods .	L1	5
	b	Write a program to generate two square wave: One of 10KHz frequency at pin P2.1 and another of frequency 20KHz at the pin 2.3. Assume XTAL=11.0592MHz. Use timer 0 and timer 1 interrupt. Show the calculations of ISR address of timer 0 and timer 1interrupt, TMOD, IE, TH0 and TH1.	L4	10
	c	Show the instructions to enable the serial interrupt, timer 1 interrupt and external hardware 0 interrupt. Show how to disable all interrupts with a single instruction.	L1	5
		Module-5		
Q. 09	a	For the 14 pin LCD,, explain the working of different pins and draw the interfacing diagram of LCD with 8051 microcontroller.	L1	10
	b	Draw the interfacing diagram of 0808 ADC with microcontroller and write a program to interface ADC . Assume Channel 3 to read the analog data.	L3	10
		OR		
Q. 10	a	Using DAC interface, write a program to generate staircase waveform. Assume number of steps to be 5.	L3	5
	b	Draw and explain the control word format of 8255A.	L1	5
	c	Explain construction and working of 4 phase unipolar stepper motor. Write a program to run the stepper motor 62^0 clockwise . Assume step angle of 2^o	L2	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.