USN | | | | | | | | | | | **BEC405A**

Fourth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Microcontrollers

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Bring out the difference between Microprocessor and Microcontroller.	04	L2	CO1
	b.	With function of each pin, explain the pin layout of 8051 Microcontroller.	10	L2	CO1
	c.	Summarize the internal RAM configuration of 8051.	06	L2	CO1
		OR			
Q.2	a.	Differentiate between CISC and RISC processor architectures.	04	L2	CO1
	b.	With a neat architecture, explain the architectural features of 8051.	08	L2	CO1
	c.	Interface 8051 microcontroller to 16K bytes of EPROM and 8K bytes of RAM. Explain with neat sketch.	08	L3	CO1
		Module – 2			
Q.3	a.	What is an addressing mode? Explain 4 different addressing modes of 8051 with examples.	08	L2	CO2
	b.	Illustrate with a neat diagram different ranges of jump instructions.	06	L2	CO2
	c.	Write an ALP to convert a packed BCD number into two ASCII numbers. Store the result in R5 and R6 respectively.	06	L2	CO2
		OR			
Q.4	a.	Define assembler directives. Explain the same with examples.	08	L2	CO2
	b.	List and explain bit level logical instructions in 8051.	06	L2	CO2
	c.	Develop an assembly language program to swap the contents of R3 and R4 registers in BANK0 using different methods.	06	L2	CO2
		Module – 3			
Q.5	a.	Explain the bit contents of TCON and TMOD registers.	06	L2	CO3
	b.	Develop an ALP to generate a square wave of frequency 1 kHz on Pin P1.2 using Timer 0 in mode 2. Show the delay calculation. Assume XTAL frequency = 22 MHz.	06	L3	CO3
	c.	Explain RS232 in serial communication using 8051 Microcontroller with DB-9 pin connector.	08	L2	CO3
		OR			
Q.6	a.	Explain the bit pattern of SCON register with diagram.	04	L2	CO3
	b.	Develop an 8051 C program to transfer letter "A" serially at 9600 baud rate, 8 bit data, 1 stop bit, do this continuously.	08	L3	CO3
	c.	Explain Mode 2 operations of timers and explain steps involved in programming timer in Mod 2, with necessary diagram.	08	L2	CO3
		Module – 4			
Q.7	a.	Explain the structure of interrupt priority and interrupt enable register.	08	L2	CO4
	b.	Explain interrupt vector table of 8051 Microcontroller.	06	L2	CO4
	c.	Explain programming of Timer interrupts.	06	L2	CO4

		OR			
Q.8	a.	List the steps involved in executing an interrupt.	04	L2	CO4
	b.	Write an ALP program using interrupts to generate a square wave on port pin P1.2 of 10 kHz using timer 0 in mode 2, XTAL = 22 MHz.	08	L3	CO4
	c.	Explain the steps involved in programming serial communication interrupts.	08	L2	CO4
		Module – 5			
Q.9	a.	With a neat diagram, write an 'C' language program to interface DAC to 8051 Microcontroller to generate staircase waveform with 20 steps.	10	L3	CO5
	b.	Explain the interfacing of DC motor using C programming.	10	L3	CO5
		OR			
Q.10	a.	With neat diagram, write an C language program to interface stepper motor to 8051 Microcontroller.	10	L3	CO5
	b.	Write a C program to display 'HELLO WORLD' by interfacing LCD display to 8051 Microcontroller.	10	L3	CO5

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