CBCS SCHEME

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BEE403

Fourth Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024

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.	Draw and explain the architecture of 8051 Microcontroller.	08	L2	CO1
	b.	Compare Microprocessor with Microcontroller.	06	L1	CO1
	c.	Explain with the help of diagram, how to interface external RAM memory to 8051 Microcontroller.	06	L2	CO1
		OR			
Q.2	a.	List the various addressing modes of 8051 Microcontroller and explain them with examples.	08	L3	CO2
	b.	Draw the neat pin diagram of 8051 Microcontroller and describe the functions of various pins.	08	L1	CO1
	c.	Explain the program status word register of 8051 Microcontroller.	04	L2	CO1
		Module – 2			
Q.3	a.	Define assembler directives. Explain the assembler directives of 8051 Microcontroller with examples.	08	L2	CO2
	b.	Write an assembly language program to realize NAND operation.	06	L3	CO2
	c.	Write a program to find factorial of a number.	06	L3	CO2
		OR			
Q.4	a.	Write a program to (i) load the accumulator with the value 44H and (ii) Complement the Acc (accumulator) 600 times.	06	L3	CO2
	b.	Explain the following instructions with examples: (i) DA A (ii) PUSH direct (iii) RLA (iv) SWAP A	08	L2	CO2
	c.	Write an assembly language program for finding largest number in an array.	06	L3	CO2
		Module – 3			
Q.5	a.	Explain the bit structure of TMOD register.	06	L2	CO3
	b.	Write an 8051 C program to toggle all bits of port P0 and P1 continuously with 250 ms delay in between.	06	L3	CO3
	c.	Write 8051 program to generate square wave with t_{ON} = 3 ns and t_{OFF} = 10 ns on all pins of port 1. Assume XTAL = 22 MHz.	08	L3	CO3
		OR			
Q.6	a.	Explain Mode-2 programming of 8051 timer. Explain the different steps to program in Mode 2.	08	L2	CO3
	b.	Write a 8051 C program to send out the value 55H serially one bit at a time via P1.0. The LSB should go out first.	06	L3	CO3
	c.	Write an 8051C program to convert ASCII digits of '4' and '7' to packed BCD and display them on P1.	06	L3	CO3

		Module – 4			
Q.7	**a.**	Explain the bit contents of IE and IP registers.	**08**	**L1**	**CO4**
	b.	Write an 8051C program to transfer the message "YES" serially at 9600 baud, 8 bit data, 1 step bit. Do this continuously.	**06**	**L3**	**CO4**
	c.	Explain the steps in executing an interrupt.	**06**	**L2**	**CO4**
		OR			
Q.8	**a.**	Explain the various handshaking signals of RS232 communication standard.	**06**	**L2**	**CO4**
	b.	Explain the serial communication modes 0 and 1 of 8051 microcontroller,	**08**	**L2**	**CO4**
	c.	Write a 8051C program using interrupts to : (i) Generate a 10000 Hz frequency on P2.1 using Timer 0 8 bit auto-reload (ii) Use Timer 1 as an event counter to count up a 1 Hz pulse and display it on P0. The pulse is connected to EX 1. Assume XTAC = 11.0592 MHz, Baud rate = 9600.	**06**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Explain the interfacing of ADC 0808 to 8051 microcontroller.	**08**	**L2**	**CO5**
	b.	Write 8051C program to rotate stepper motor in clockwise direction.	**06**	**L3**	**CO5**
	c.	Explain interfacing between 8051 microcontroller and keyboard and explain scanning and identifying the key pressed.	**06**	**L2**	**CO5**
		OR			
Q.10	**a.**	Draw the block diagram of 8255 chip and explain.	**06**	**L2**	**CO5**
	b.	Explain the interfacing of DAC with 8051.	**08**	**L2**	**CO5**
	c.	Explain the interfacing of 8051 Microcontroller with DC motor through opto isolator.	**06**	**L2**	**CO5**

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