CBCS SCHEME

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BEE403

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

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.	Explain the important features of 8051 microcontroller.	06	L1	CO1
	b.	Explain the working of stack and stack pointer.	06	L1	CO1
	c.	Explain addressing modes of 8051 microcontroller with an example.	08	L1	CO1
		OR			
Q.2	a.	Describe various pins of 8051 microcontroller with Pin diagram.	08	L1	CO1
	b.	Explain the PSW resister with bit pattern. Discuss the functions of each flag in detail.	06	L1	CO1
	c.	Compare microcontroller and microprocessor.	06	L1	CO1
		Module – 2			
Q.3	a.	Explain the following assembler directives : i) ORG ii) EQU iii) END iv) DB	08	L2	CO2
	b.	Explain the following instructions of 8051 with examples: (1) XCHD A, @R_1 (2) MOVC A, @A+PC (3) RL A (4) MUL A B (5) DA A (6) SWAP A	12	L2	CO2
		OR			
Q.4	a.	Write an 8051 ALP to find average of marks scored by students in 6 subjects. Assume the marks are stored from location 40h and its average is to be stored at location 50h.	08	L3	CO2
	b.	Discuss Call and Jump instruction types and name of branches in each case.	12	L2	CO2
		Module – 3			
Q.5	a.	Discuss the Data types in 8051C.	06	L1	CO3
	b.	Explain TMOD and TCON with its bit pattern.	06	L1	CO3
	c.	Write an 8051 C program to convert ASCII digit of 4 and 7 to packed BCD and display them on P_1.	08	L3	CO3
		OR			
Q.6	a.	Write an 8051 C program to toggle all bits of P_2 continuously every 500 ms. Use Timer1 mode-1 to create the delay.	08	L3	CO3
	b.	Write a 8051 C program to bring in a byte of data serially one-bit at a time via $P_{2.0}$ the MSB should come in first.	08	L3	CO3
	c.	Explain the characteristics and operation of Mode-2 program in 8051 timers.	04	L1	CO3
		Module – 4			
Q.7	a.	Explain RS232 handshaking signal and specify the purpose of Max232 while interfacing.	06	L2	CO4
	b.	Write an 8051 C program to transfer the message INDIA serially at 9600 baud rate.	08	L3	CO4
	c.	Explain simplex, half duplex and full duplex serial data transfer.	06	L2	CO4

		OR			
Q.8	**a.**	Write a program to retrieve the data serially and put them in P_1. Set the baud rate at 4800, 8-bit data and one stop bit.	**06**	**L3**	**CO4**
	b.	What is an Interrupt? List various interrupts of the 8051 with their corresponding vector address.	**08**	**L1**	**CO4**
	c.	Write an ALP program to send 'Y' serially on 8051. Use baud rate of 2400 bauds.	**06**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Explain the internal architecture of ADC 0804.	**06**	**L1**	**CO1**
	b.	Explain the construction and working of stepper motor along with 4-step sequence table.	**07**	**L1**	**CO5**
	c.	Write a C program to rotate stepper motor continuously.	**07**	**L3**	**CO5**
		OR			
Q.10	**a.**	Explain the block diagram of 8255 chip.	**10**	**L1**	**CO5**
	b.	A switch is connected to pin $P_{2.7}$. Write a C program to monitor the status of SW and perform the following : If SW = 0 ; The stepper motor moves clockwise If SW = 1 ; The stepper motor moves counter clockwise	**10**	**L3**	**CO5**

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