Basavarajeswari Group of Institutions

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN											Course Code	2	2	E	C	4	6	1

Fourth Semester B.E. Degree Examinations, September-2024

8051 Microcontroller

Duration: 3 hrs **Max. Marks: 100**

Note: 1. Answer any* FIVE *full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

Q. No		*Question*	*Marks*	*(RBTL:CO:PO)*
		Module-1		
1.	**a.**	With the help of neat diagram explain the internal block diagram of 8051	**8**	(2 : 1 : 1.3.1)
	b.	Explain the memory organization of 8051 microcontroller	**8**	(1 : 1 : 1.3.1)
	c.	Define embedded systems. Write down the applications of embedded systems	**4**	(1 : 1 : 1.3.1)
		OR		
2.	**a.**	Explain with a neat pin diagram of 8051.	**8**	(1 : 1 : 1.3.1)
	b.	Differentiate between Microcontroller and Microprocessor	**6**	(2 : 1 : 1.3.1)
	c.	Explain the significance of Program status word and briefly discuss PSW register of 8051	**6**	(2 : 1 : 1.3.1)
		Module-2		
3.	**a.**	What are addressing modes? Explain different addressing modes of 8051	**8**	(1 : 2 : 1.3.1)
	b.	Explain the following instructions i)XCHD A, @Ri ii) SWAP A iii) CJNE A, #29, AGAIN iv)DAA v) MOVC A, @A+DPTR	**6**	(2 : 2 : 1.3.1)
	c.	Write an assembly program multiply two 8-bit numbers stored at address 80h and 81h and store 16-bit result in 52h and 53h of internal ram address.	**6**	(3 : 2 : 1.7.1)
		OR		
4.	**a.**	State the type of addressing modes of the following instructions i)ADD A,30h ii) CJNE A, #29, AGAIN iii) INC @R0 iv)XCD A, R0 v) CLR C vi) MOVC A, @A+PC	**6**	(2 : 2 : 1.7.1)
	b.	Explain Shifting/rotate instruction with example	**8**	(1 : 2 : 1.3.1)

	c.	Show the status of all flags after execution of following instructions.
		MOV A, #9Ch
		ADD A, #64h
			6	(2 : 2 : 1.7.1)

		Module-3		
5.	**a.**	Explain the steps involved when CALL and RET instructions get executed	**8**	(1 : 3 : 1.3.1)
	b.	Differentiate between JUMP and CALL instruction.	**4**	(2 : 3 : 1.3.1)
	c.	Write a program to find largest number from a given array starting from 20h and store it in internal memory location 40h	**8**	(3 : 3 : 1.7.1)
		OR		

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI – Programme Outcome)

6.	**a.**	Explain Stack operation instructions with example	**6**	(1 : 3 : 1.3.1)
	b.	Write an assembly program to transfer a 5 blocks of data from internal memory 20h to external memory 4000h.	**8**	(3 : 3 : 1.7.1)
	c.	With neat diagram, explain the range associated with JUMP instruction	**6**	(2 : 3 : 1.3.1)

Module-4

7.	**a.**	Explain TMOD and TCON registers in detail	**10**	(2 : 4 : 1.3.1)
	b.	Write a program to generate a Pulse width of 50ms on P2.3 using Timer 0 operating in mode 1. Assuming crystal frequency =12MHz	**10**	(3 : 4 : 1.7.1)

OR

8.	**a.**	Explain SCON and PCON register.	**10**	(2 : 4 : 1.3.1)
	b.	Write an assembly program to transfer the message "GOODLUCK" serially at 9600 baud rate,8-bit data,1 stop bit.	**10**	(3 : 4 : 1.7.1)

Module-5

9.	**a.**	Explain IP and IE register with their bit pattern and show how priorities change	**10**	(2 : 5 : 1.3.1)
	b.	Write an ALP in 8051 to generate a square wave of frequency 5KHz on pin P2.7 using timer 1 interrupt mode. Assume crystal frequency as 12MHz.	**10**	(3 : 5 : 1.7.1)

OR

10	**a.**	Write a C program to rotate stepper motor continuously	**10**	(3 : 5 : 1.7.1)
	b.	Write a C program to generate a Sine wave using 8051 and DAC	**10**	(3 : 5 : 1.7.1)

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Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI – Programme Outcome)