VIT
Vellore Institute of Technology
CHENNAI

Reg. Number:

Continuous Assessment Test (CAT) – I - AUG 2024

Programme	:	**B.Tech (BCE/BPS/BAI/BRS)**	Semester	:	Fall Semester 24-25
Course Code & Course Title	:	BECE204L; Microprocessors and Microcontrollers	Class Number	:	CH2024250100330, CH2024250100332, CH2024250100334, CH2024250100336, CH2024250100338, CH2024250100513
Faculty	:	**Dr. Subhashini N, Dr. Rahul Narasimhan, Dr. Manoj Kumar R, Dr. Balakrishnan R, Dr. Karthikeyan P R Dr. Richards Joe Stanislaus**	Slot	:	**D1+TD1**
Duration	:	90 min	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Sub Sec.	Description	Marks	Blooms Taxonomy Level
1.		Find the value to be loaded into register R1 (**XX**) in the given 8051 ASM program such that it creates a delay of 2 seconds. Assume that the crystal frequency is 33 MHz.	**5**	L4
2.		A computer is connected to 8051 microcontroller through serial port. Write an assembly language program for 8051 microcontroller, to transmit an emergency message "ALERT!" repeatedly to the computer. Use a baud rate of 9600 bps, where the clock frequency of the microcontroller is 11.0592 MHz.	**5**	L3

Instruction	No. of Machine Cycle
MOV R1, #**XX**	1
Loop3: MOV R2, #200	1
Loop2: MOV R3, #200	1
Loop1: DJNZ R3, Loop1	2
DJNZ R2, Loop2	2
DJNZ R1, Loop3	2
RET	2

3.		a) Explain RAM organization of 8051 microcontroller.(7) b) Briefly explain the Special function registers in 8051 microcontroller. (3)	10	L1
4.		A parking lot has a capacity of parking 10 cars and has one green LED and one red LED to indicate space availability. If the parking lot has a minimum of one vacant space, a green led glows as an indicator and red LED is off. If the parking lot has no vacant space, the green LED switches off and a red LED is switched on. An 8051 microcontroller is used for the counting the number of cars available at a given time. Write an assembly language program using 8051 microcontroller to count the number of cars entering the parking lot using counter of 8051. Implement the functionality of green LED connected at P1.5 and red LED connected at P1.6.	10	L4
5.		Complete the following table by specifying the memory location affected and the value stored at that location after the execution of each line in the given program.	10	L3

	ORG 0000H	**Address of the Memory location**	**Value stored at the memory location**
Line1	MOV A, #18H		
Line2	MOV R3,#1BH		
Line3	XRL A,R3		
Line4	MOV 31,A		
Line5	SETB 27		
Line6	RLC A		
Line7	MOV 26,#33H		
Line8	MOV PSW, #18h		
Line9	MOV R4,31		
Line10	PUSH 3		
Line11	POP 22		
	END		

6.		Write an assembly language program for 8051 microcontroller to connect the status of 8 switches in Port P0 to 8 LEDs connected to port P1. If the hexadecimal value in the ports is greater than 0C4H, then assign the value of 01H to R2. If the value in the ports is smaller or equal to 0C4H, then assign the value of 02H to R2 register. Iterate the complete process within an infinite loop.	**10**	L4

**********All the best **********