VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act. 1956)

Continuous Assessment Test II – April 2024

Programme	: B.Tech (ECE & ECM)			
Course	:		Semester	: WS 2023-24
			Code	: BECE320E
	Embedded C Programming		Class Nbr	: CH2023240503277 CH2023240503281 CH2023240503283 CH2023240503263 CH2023240503267 CH2023240503269 CH2023240503275 CH2023240503271 CH2023240503261
Faculty	: Dr. Markkandan, Dr. G. Sudhakaran, Dr. R. Balakrishnan, Prof. Srinivasan R, Prof. Premanand S, Prof. Hemavathy S, Prof. Deepa M Prof. Ajeyprasaath KB Prof.M.KrithikaaliasAnbuDevi		Slot	G2
Time	: 90 Minutes		Max. Marks	: 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__ the questions

Q.No.	Sub. Sec.	Questions	Marks
1.		Suppose you're developing a home automation system employing the 8051 microcontrollers considering the following constraints:	10

Entry board displays "*" continuously at a baud rate of 19200 bps. When a person enters, the entrance lighting should be turned ON at 500μs using a timer, which interrupts the display board with a message "WELCOME" at a baud rate of 4800 bps.

How would you utilize the Special Function Registers (SFRs) to manage this scenario? Explain the contents of the required SFRs with the appropriate HEX values.
(Embedded C code not expected)

2.	Develop a system with an 8051 microcontroller to monitor the water level in a tank. A water level sensor is interfaced with pin P2.4, and an alarm buzzer is connected to pin P0.7. Design and implement an 8051 C program to activate the buzzer when the water level exceeds a predefined threshold of 80 (range: 0-255). Provide a clear explanation of your code logic and the threshold determination process.	15

3.	Design an embedded system that controls a security mechanism. The system has two input switches (SW1 and SW2) and one output LED. The security mechanism should activate the LED under the following conditions: · Activate the LED if both the switches are pressed simultaneously. · Activate the LED if either switch or both switches are pressed. · Activate the LED if only one of the switches is pressed. Write an embedded C program for an 8051 microcontroller to implement these logical operations and control the LED accordingly.	10

4.

Write an 8051 C program to design a 4-way traffic light controller using timer functions. Explain how the timers are utilized to manage the timing of the traffic lights at an intersection. Assume East traffic lights (red, yellow, green) are connected on P0.0, P0.1, P0.2, West traffic lights are connected on P1.0, P1.1, P1.2, North traffic lights are connected on P2.0, P2.1, P2.2, and South traffic lights are connected on P3.0, P3.1, P3.2. The timing sequence for the traffic lights is as follows:

Direction	Red	Yellow	Green
East	3 sec	1 sec	3 sec
West	3 sec	1 sec	3 sec
North	3 sec	1 sec	3 sec
South	3 sec	1 sec	3 sec

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