Reg. No.: 21BPS1384

Name : A. Hemalatha.

VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test I – February 2024

Programme	:	**B. Tech (CSE) & B.Tech. CSE (AI & ML, CPS, AIR)**	Semester	:	**WS 2023-24**
Course	:		Code	:	**BCSE305L**
		Embedded Systems	Class Nbr	:	**CH2023240501851 CH2023240501862 CH2023240501842 CH2023240501855 CH2023240501860 CH2023240501849 CH2023240501844 CH2023240501909 CH2023240501907 CH2023240501892 CH2023240501888**
Faculty	:	**Dr. R. Dhanush Dr. Hariharan I Dr. Chanthini Baskar Dr. Sindhuja M Dr. C. Sridhar Dr. Karthikeyan P R Dr. G. Gugapriya Prof. Satheeshkumar T Dr. Balakrishnan R Dr. Bala Murugan MS Dr. Vijayakumar P**	Slot	:	**D2 + TD2**
Time	:	**90 Minutes**	Max. Marks	:	**50**

Answer ALL the questions

Q.No.	Sub. Sec.	Questions	Marks
1.		An Adaptive Cruise Control (ACC) system is designed to help the vehicle to maintain a safe following distance and stay within the speed limit. This system adjusts a car's speed automatically so drivers don't have to adjust the speed. Elaborate the design challenges, memory requirements, hardware components and phases in designing cruise control system with the help of block diagram.	[15]
2.		Draw and elaborate the architecture of ARM processor.	[10]
3.		Write an Arduino program to design an automatic hand sanitizer dispenser and temperature measurement system for a super market whose requirements are given below. • The system should be contact less. • The door opens only if the temperature is within the normal temperature limit. An alarm is sounded if a person is identified with temperature which is not within the limit. Choose appropriate sensors and actuators for your design. Note: Normal temperature limit: 97F to 99F.	[10]

4. Write an Arduino program to design a smart parking system using HC-SR04 ultrasonic sensor, servo motor, buzzer and Arduino Uno. With the following specification: [15]

- The ultrasonic sensor module placed near the entry gate continuously checks for the incoming vehicles.
- When a vehicle comes closer to the ultrasonic sensor detection area and parking slot is available then the system opens a gate barrier to 90° (close after 10 seconds) to allow the vehicle to the parking slot and decrements the available parking slot by 1.
- If no parking slot is available, switch on the buzzer for 5 seconds.

Have a similar system on the exit and increment the free slot by 1 for every vehicle which leaves the parking slot.

Note: Total capacity of the parking slot is 15.

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