VIT

Vellore Institute of Technology

Continuous Assessment Test I – January 2025

Programme	:	B.Tech. (CSE)		Semester	:	Winter 2024-25
Course	:			Code	:	BCSE305L
				Class Nbr	:	CH2024250501684 CH2024250501686 CH2024250501690 CH2024250501693 CH2024250501705
		Embedded Systems				
Faculty	:	Mr. Pugazhenthi R, Dr. Dhanush R, Dr. Sritama Roy, Dr. Manigandan M, Dr. Manimaran P		Slot	:	G1+TG1
Time	:	90 Minutes		Max. Marks	:	50

Answer ALL the questions

Q.No.	Sub. Sec.	Questions	Marks	BT Level
1.		Describe the design process for a smart stair elevator system in the shopping mall which includes sensor placement, LED indicators, and operational features. With a neat block diagram, Elaborate on the design challenges, memory requirements, hardware/software architecture, and phases in designing a smart stair elevator system.	15	2
2.		With a neat sketch of the functional block diagram/architecture and describe the salient features available in the microcontroller runs on CISC instruction set.	10	2
3.		Write an Arduino program to design an automatic hand sanitizer dispenser and temperature measurement system for a supermarket whose requirements are given below.	15	3

3. (continued)

- The system should be contactless and check the user presence using an analog photo sensor with a digital output value of less than 150 implies the user presence.
- Dispense the sanitizer after checking the temperature with the actuator movement to 90° and comes back to 0°.
- The door opens only if the temperature is within the normal temperature limit.

An alarm is sounded if a person is identified with a temperature that is not within the limit. Choose appropriate sensors and actuators for your design.

Note: Normal temperature limit: 36.5 to 37.5 C.

| 4. | | Design an automatic lawn watering system that is scheduled to water the lawn once every 8 hours with the following conditions. | 10 | 3 |

i) Need to vary the angle of the watering hose by 1° for every 2 seconds to reach 180° and return to 0° after a complete cycle.

ii) For every 8 hours, the watering system should water for 15 cycles (0° to 180° and 180° to 0° motion) and return to 0° after the 15th cycle of watering.

Also, check the entrance with an ultrasonic sensor to ensure the visitor's presence. Note that the entrance has a fixed distance of 80cm to differentiate the person's arrival. As

soon as the sensing system observes a person's arrival it should pause the watering system for 30 seconds temporarily and resume the watering after 30 seconds.

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