University of Asia Pacific

Department of Computer Science and Engineering

CSE 315: Microprocessor and Microcontroller

Assignment Number: 03

Assignment Question: You are part of a research team at MediTech Logistics, a company designing smart vaccine transport systems for rural healthcare delivery. Your task is to design and explain a Cold Chain Vaccine Transport Box using an ESP32 microcontroller and appropriate sensors. The system must maintain vaccines within a safe temperature range (2°C to 8°C) during transportation. If the temperature goes outside this range or the box lid is opened for too long, the system should trigger alerts and record the event for traceability.

I. Draw a hand-drawn block diagram of the system showing all sensors, actuators, and the ESP32 microcontroller with proper pin connections.
II. Write an explanation of how your system behaves under different conditions. Define and justify your own threshold values for temperature, humidity, and light intensity based on real vaccine storage requirements.
III. Design a flowchart and pseudocode showing: Continuous sensor monitoring, Decision-making process, Actuator control, Alert conditions ,Timing or delay logic
IV. Explain why the ESP32 is suitable for this system.
V. Describe one innovative feature you would add.
VI. Discuss how your design would handle sensor failure or false readings.

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