WORLD MISSION
HIGH SCHOOL

DECISION	

EXAM DETAILS		TRAINEE'S DETAILS	
Sector	ICT & MULTIMEDIA	Trainee's name	
Trade	NIT	Trainer's name	H. Love
Module code	NITID401	Module title	IoT SYSTEM DEVELOPMENT
Level	L4	Date	

(Answer all Questions)

1.

You are tasked with developing an IoT smart-farming system. Based on functional and non-functional requirements, List ten(10) functional and non-functional requirements for this system.

2.

Practical Scenario: Ultrasonic Distance Alert System

Scenario Description

A school plans to install a **smart distance alert system** at the entrance of a laboratory to help monitor how close a person or object is to sensitive equipment. As part of this system, an **Arduino Uno**, an **ultrasonic sensor (HC-SR04)**, **four LEDs**, and a **piezo buzzer** are used.

The ultrasonic sensor continuously measures the distance between the sensor and any object in front of it. Depending on the measured distance, different LEDs are activated to visually indicate how close the object is. If the object comes **too close (within 10 cm)**, a piezo buzzer is activated to warn the user.

System Requirements

1. The ultrasonic sensor must measure distance in centimeters.
2. The system must display the measured distance on the Serial Monitor.
3. The LEDs must behave as follows:

- **LED1 ON** when distance is **10 cm or less**
- **LED2 ON** when distance is **11–20 cm**
- **LED3 ON** when distance is **21–30 cm**
- **LED4 ON** when distance is **31–40 cm**
- **All LEDs OFF** when distance is greater than 40 cm

4. The **piezo buzzer must turn ON** when the distance is **10 cm or less** and turn OFF for all other distances.
5. The system must update its readings continuously.

Student Tasks

a) Identify the role of the trigPin and echoPin in the ultrasonic sensor.
b) Explain how the distance is calculated from the echo signal in the program.
c) Describe the condition under which the piezo buzzer is activated.
d) Predict which LED will turn ON if the measured distance is:

- **i) 8 cm**
- **ii) 18 cm**
- **iii) 28 cm**
- **iv) 45 cm**