ANNEXURE -A

SOURCE CODE

```
#include <Wire.h>

#include <OneWire.h>

#include <Wire.h>

#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

#include <dht.h>  // Include library

#define outPin 2  // Defines pin number to which the sensor is connected

dht DHT;  // Creates a DHT object

// // Pin Assignments const int voltageSensorPin = A2;  //

Voltage sensor input const int currentSensorPin = A3;  //

Current sensor input const int relayMotorPin = 4;      //

Relay for motor const int relayFanPin = 3;        // Relay for

fan const int relayBatteryPin = 5;    // Relay for battery

charger const int relayChargerPin = 6;    // Relay for mobile

charger

// LED Pins const int

ledTemperaturePin = 8; const int

ledBattery50Pin = 9; const int

ledBattery75Pin = 10;


void setup() {

Serial.begin(9600);
```

```arduino
  pinMode(relayMotorPin, OUTPUT);

pinMode(relayFanPin, OUTPUT);

pinMode(relayChargerPin, OUTPUT);

pinMode(relayBatteryPin, OUTPUT);

 // Define LED pins as outputs

pinMode(ledBattery50Pin, OUTPUT);

pinMode(ledBattery75Pin, OUTPUT);

pinMode(ledTemperaturePin, OUTPUT);

 // Initialize all relays to HIGH (inactive state for active-low relays)

digitalWrite(relayMotorPin, HIGH);   // Motor relay off   digitalWrite(relayFanPin,

HIGH);     // Fan relay off   digitalWrite(relayChargerPin, HIGH);  // Charger relay

off   digitalWrite(relayBatteryPin, HIGH);  // Battery relay off

 // Initialize LED states to LOW (off state)

digitalWrite(ledBattery50Pin, LOW);   digitalWrite(ledBattery75Pin,

LOW);   digitalWrite(ledTemperaturePin, LOW);

 lcd.begin(16, 2);

lcd.backlight();   lcd.setCursor(0,

0);   lcd.print("System Ready!");

}

void loop() {   float voltageSensorValue = analogRead(voltageSensorPin) *

(5.0 / 1023.0);   float voltage = voltageSensorValue * 5.0;   float current =

analogRead(currentSensorPin) * (5.0 / 1023.0);
```

```
  int batteryPercentage = 0;   if (voltage >= 10.0)

batteryPercentage = 100;   if (voltage >= 9.0 && voltage <

10.0) batteryPercentage = 75;   if (voltage >= 8.0 && voltage <

9.0) batteryPercentage = 50;   if (voltage >= 7.0 && voltage <

8.0) batteryPercentage = 25;   if (voltage < 7.0)

batteryPercentage = 0;

  int readData = DHT.read11(outPin);
  float t = DHT.temperature;  // Read temperature   float

h = DHT.humidity;     // Read humidity

  String data = "a" + String(voltage, 2) + "b" + String(current, 2) + "c" + String(t, 2)+ "d"+
String(batteryPercentage)+"e";

  Serial.println(data);

  lcd.setCursor(0, 0);

lcd.print("V: ");

lcd.print(voltage, 2);

lcd.print(" T:");   lcd.print(t,

1);

  lcd.setCursor(0, 1);

lcd.print("C: ");

lcd.print(current, 2);   lcd.print("

B:");

lcd.print(batteryPercentage);

lcd.print("%");

  // Motor Control

if (t >= 29) {
```

```
      digitalWrite(relay
MotorPin, HIGH);
// Turn off motor

  }   if (t < 29) {    if (voltage >= 7) {
digitalWrite(relayMotorPin, LOW);  // Turn on motor

    }

  }
  // Fan Control   if (t > 29) {
digitalWrite(relayFanPin, LOW);  // Turn on fan

  }   if (t <= 29) {    digitalWrite(relayFanPin,
HIGH);  // Turn off fan

  }
  // Charger Control   if (voltage < 7) {
digitalWrite(relayChargerPin, HIGH);  // Turn off charger
digitalWrite(relayBatteryPin, LOW);   // Turn on battery charge
digitalWrite(relayMotorPin, HIGH);    // Turn on motor

  }   if (voltage >=
7) {    if (t < 29) {
digitalWrite(relayC
hargerPin, LOW);
// Ensure charger
stays on
digitalWrite(relay
MotorPin, LOW);
```

```
// Turn on motor
digitalWrite(relayB
atteryPin, HIGH);
// Turn on battery
charge
    }   }   if (t > 29) {    digitalWrite(relayChargerPin, HIGH);  //
Turn off charger    digitalWrite(relayBatteryPin, HIGH);  // Turn
off battery charge
  }
  // LED Indicators and Buzzer   if
(voltage < 7) {
digitalWrite(ledBattery50Pin, LOW);
digitalWrite(ledBattery75Pin, LOW);
delay(500);
digitalWrite(ledBattery50Pin, HIGH);
digitalWrite(ledBattery75Pin, HIGH);
delay(500);
  }   if (voltage > 7) {    if (voltage < 9) {
digitalWrite(ledBattery50Pin, LOW);
digitalWrite(ledBattery75Pin, HIGH);

    }    if (voltage >= 9) {
digitalWrite(ledBattery50Pin, HIGH);
digitalWrite(ledBattery75Pin, HIGH);

    }
```

Temperature LED Indicator

```
if (t > 29) {        digitalWrite(ledTemperaturePin, HIGH);   // High
temperature indicator

} if (t <= 29) {    digitalWrite(ledTemperaturePin, LOW);  // Low
temperature indicator

}

delay(1000);  // 1-second interval

}
```

ANNEXURE -B

PROJECT BUDGET DETAILS

S.NO	COMPONENT NAME	COST (₹)
1	Arduino with Motor driver	2000
2	12V Battery	300
3	DC motors	400
4	LCD display	300
5	Mobile charger	300
6	Adapter and USB cable	300
7	CPU Fan	200
8	Temperature sensor	100
9	Current Sensor	100
10	Voltage sensor	100
11	Node MCU	90
12	Relays	160
13	Buzzer	50
14	Other Components	1000
	Total	**₹ 5400**

ANNEXURE -C