

MODULE 11 : AUTOMATIC HAND SANITIZER

PROJECT 2

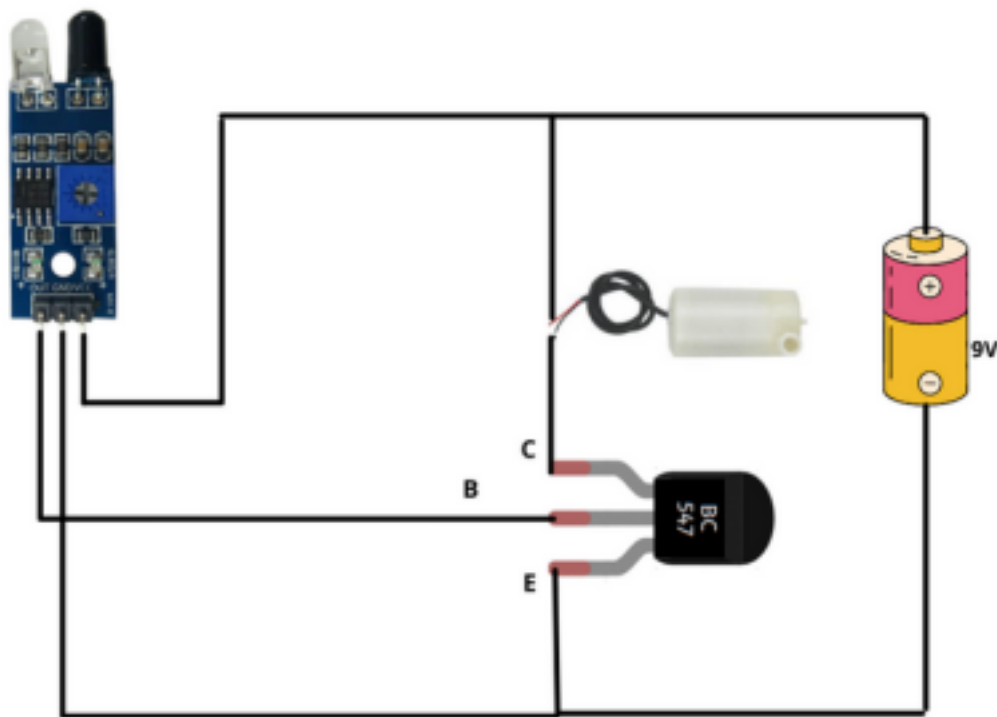
AIM:

CONSTRUCT AN AUTOMATIC HAND SANITIZER

COMPONENTS REQUIRED:

TRANSISTOR (BD 139), IR SENSOR, WATER PUMP, BATTERY,

JUMPER WIRES CIRCUIT DIAGRAM:



WORKING PRINCIPLE:

- When we power the circuit via a 9V or 5V battery the circuit is in off state there is no current flow through the transistors and the remaining circuit.
- When we place hand near the IR sensor gives an HIGH output to the transistor, then the base of the transistor gets a small current supply and the transistor will on

and allow the electrons to flow through collector to emitter.

- Whenever the transistor ONs, the waterpump will be activated and pumps the sanitizer.

CODE:

```
// Define pins for ultrasonic sensor

#define TRIG_PIN 9

#define ECHO_PIN 10


// Define pin for relay

#define RELAY_PIN 8


// Distance threshold to trigger the pump (in cm)

#define DISTANCE_THRESHOLD 10


void setup() {

    // Start serial communication for debugging

    Serial.begin(9600);


    // Set the ultrasonic sensor pins

    pinMode(TRIG_PIN, OUTPUT);

    pinMode(ECHO_PIN, INPUT);
```

```
// Set the relay pin

pinMode(RELAY_PIN, OUTPUT);


// Initialize the relay to be off

digitalWrite(RELAY_PIN, LOW);

}


void loop() {

    // Trigger the ultrasonic sensor

    digitalWrite(TRIG_PIN, LOW);

    delayMicroseconds(2);

    digitalWrite(TRIG_PIN, HIGH);

    delayMicroseconds(10);

    digitalWrite(TRIG_PIN, LOW);


    // Measure the pulse width to determine the distance

    long duration = pulseIn(ECHO_PIN, HIGH);

    int distance = duration * 0.034 / 2; // Convert duration to
cm
```

```
// Print the distance for debugging

Serial.print("Distance: ");

Serial.println(distance);


// If the distance is less than the threshold, activate the
pump

if (distance < DISTANCE_THRESHOLD) {

    digitalWrite(RELAY_PIN, HIGH); // Turn on the pump

} else {

    digitalWrite(RELAY_PIN, LOW); // Turn off the pump

}


delay(100); // Short delay to avoid flickering or rapid
on/off switching

}
```