EX.NO : 1.a DATE : 19/08/2022	TURN ON AND OFF IN THE LED -ARDUND	page. NO 01

AIM

To implement a simple LED blink and make them to glow alternatively using Arduino.

COMPONENT REQUIRED

1 x Arduino UNO
1 x Broadboard
5 x LED
5 x 330 Ω resistor
Jumper wire

PROCEDURE - CIRCUIT CONNECTION

LED1 - +ve to 0th digital pin of arduino through resistor -ve to GND

LED 2 - +ve to 1th digital pin of arduino through resistor -ve to GND

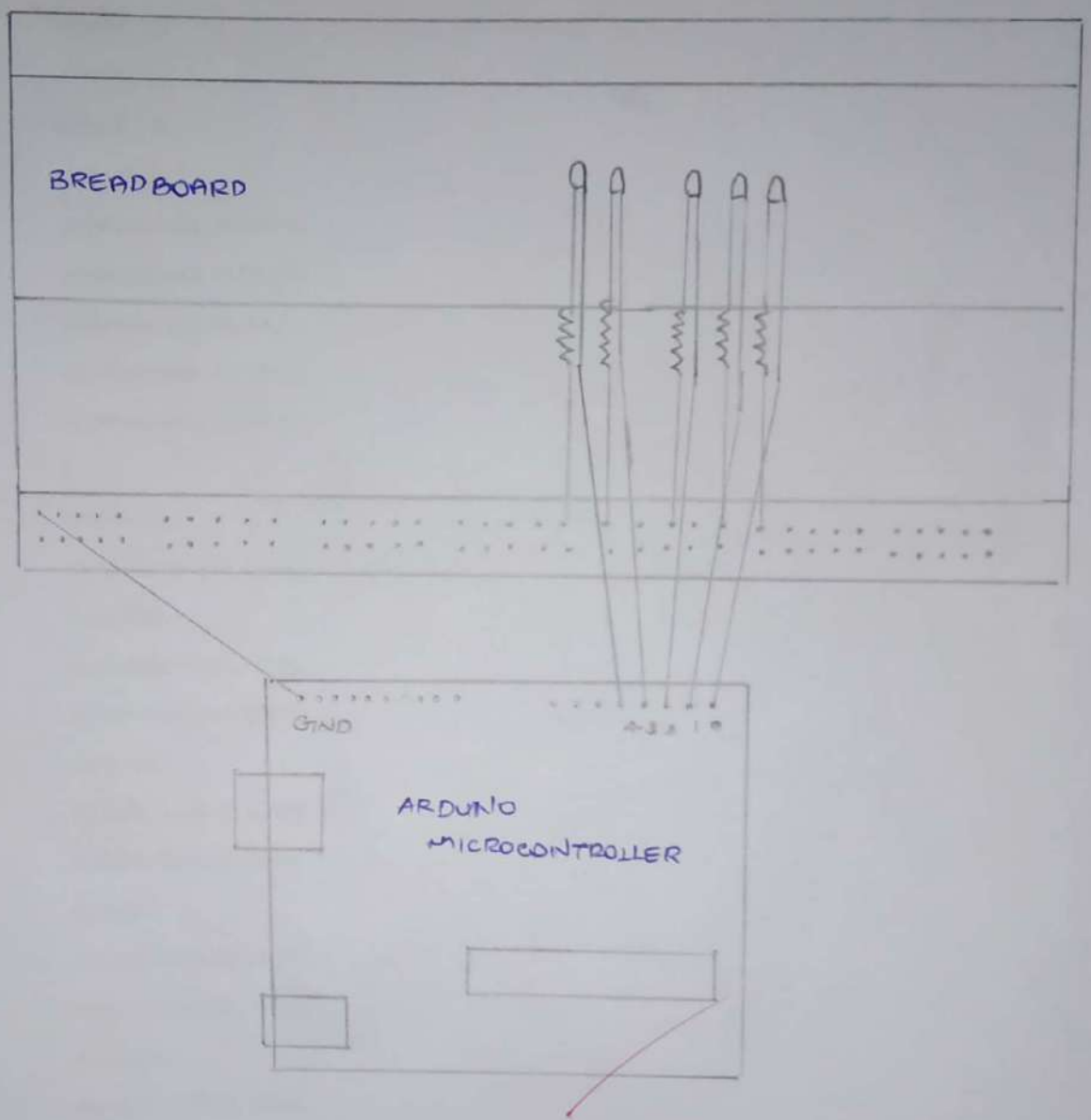
LED 3 - +ve to 2nd digital pin of arduino through resistor -ve to GND

LED 4 - +ve to 3rd digital pin of arduino through resistor -ve to GND

LED 5 - +ve to 4th digital pin of arduino through resistor -ve to GND

Then make LED's glow alternatively

CIRCUIT DIAGRAM



Ex.No : 1.b

DATE : 19/08/2022

TURN ON AND OFF THE LED - ARDUINO

Page.NO : 06

AIM :

To make the LED's glow corresponding to number provided by user through serial monitor using arduino.

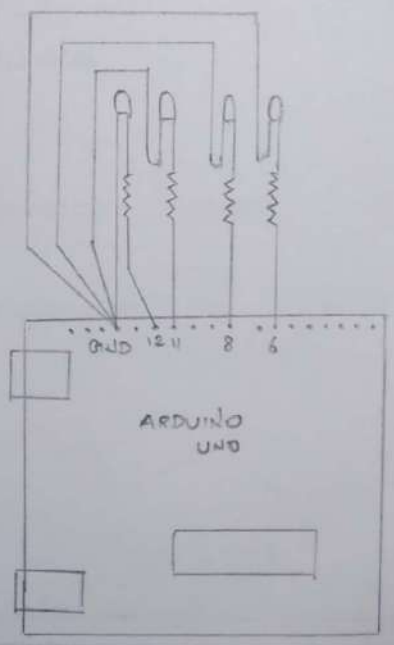
COMPONENTS REQUIRED

- 1 x Breadboard
- 1 x Arduino UNO
- 4 x LED's
- 4 x Resistor
- Jumper wire

PROCEDURE - CIRCUIT CONNECTION

Connect -ve of LED 1, 2, 3, 4 to GND in arduino
+ve of LED 1 to pin 6 in arduino
+ve of LED 2 to pin 8 in arduino
+ve of LED 3 to pin 11 in arduino
+ve of LED 4 to pin 12 in arduino
Then make the LED glow corresponding to number provided using serial monitor.

CIRCUIT DIAGRAM



EX.NO : 1.c DATE : 19/08/2022	TURN ON AND OFF THE LED - Raspberry pi	Page.NO : 10

AIM

TO make the LED's glow based on random numbers generated using raspberry pi.

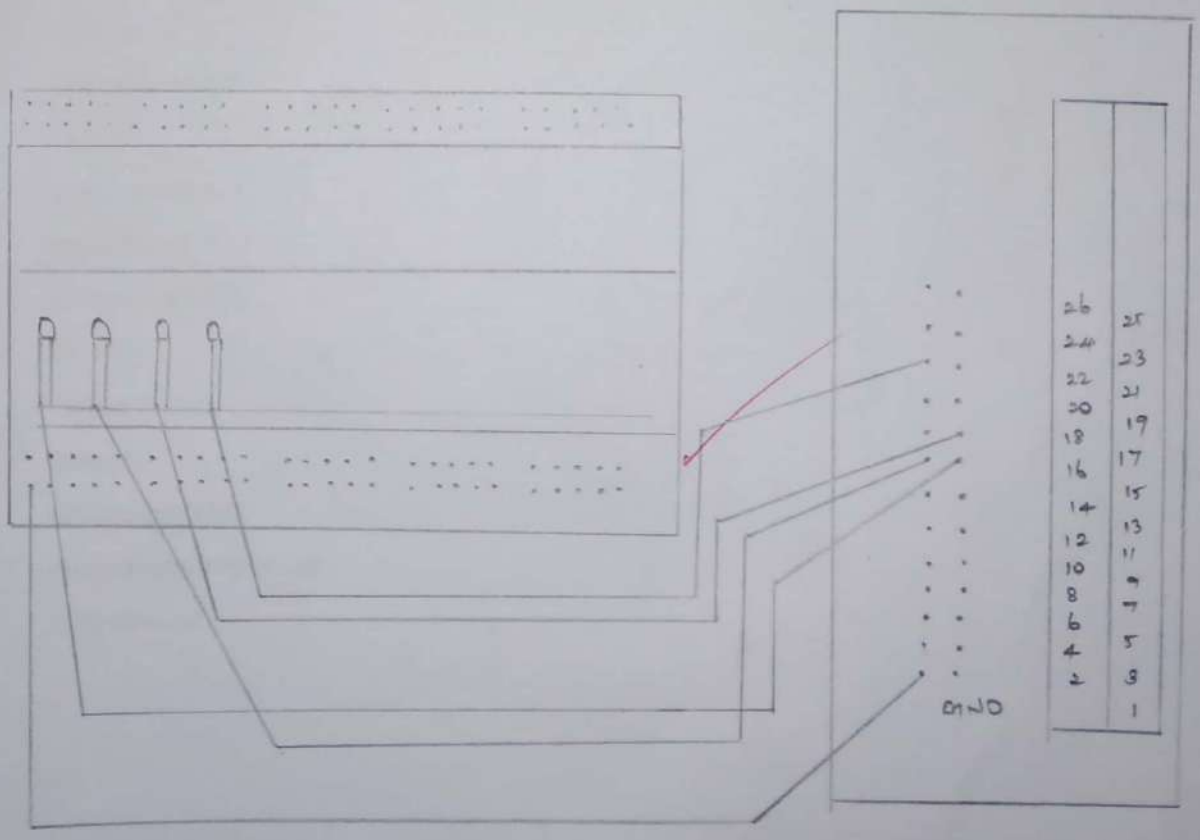
COMPONENTS REQUIRED

1 x Breadboard
1 x Raspberry pi
4 x LED
Jumper wire

PROCEDURE - CIRCUIT CONNECTION

connect +ve of LED 1, 2, 3, 4 to board to pin 3
+ve of LED 1 - Board pin 15
+ve of LED 2 - Board pin 16
+ve of LED 3 - Board pin 18
+ve of LED 4 - Board pin 22
Then MAKE LED glow based on random wise.

CIRCUIT DIAGRAM



Ex.No: 2.a DATE: 26/08/2022	IDENTIFY THE OBJECTS USING IR AND PIR SENSOR - ARDUINO	Page.No: 14

AIM

To design an alert system using PIR sensor to detect motion of objects and make buzzer to sound.

PIR sensor

- PIR sensor allows to sense motion
- They are small, inexpensive, low power, easy to use and don't wear out.
- PIR sensor that measure infrared light radiating from objects.
- PIR sensor mostly used in PIR motion based detectors.
- It is used in security alarms and automatic lightning application.

COMPONENT REQUIRED

1 x Breadboard
1 x Arduino UNO
1 x PIR sensor
1 x Buzzer
Jumping wires

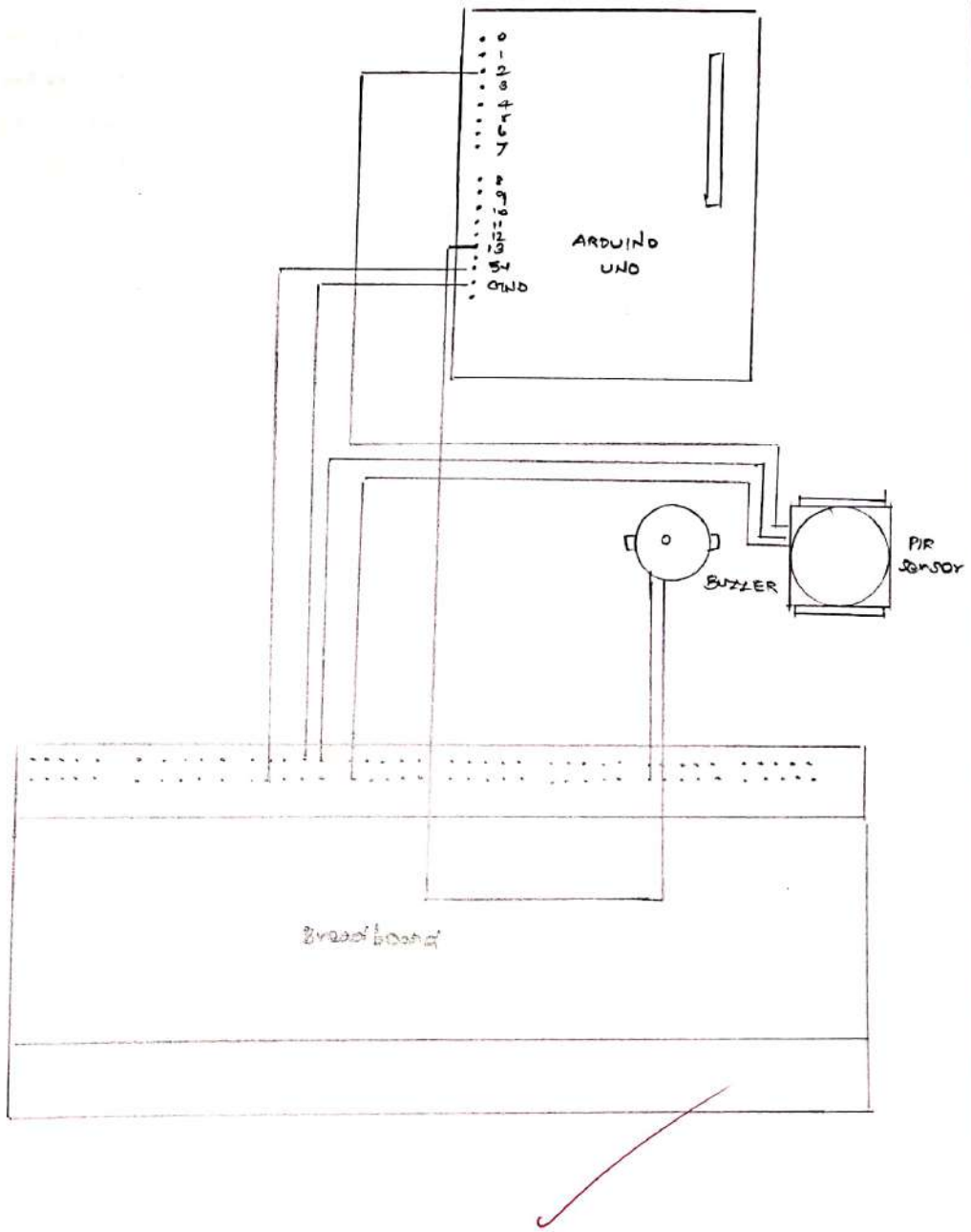
PROCEDURE - CIRCUIT CONNECTION

PIR sensor - +vcc to 5V of arduino, GND to GND of arduino, out pin to A2 pin of arduino.

Buzzer - +ve to Digital 13 of arduino and -ve to GND of arduino

when sensor of PIR detect motion, buzzer make an alert.

CIRCUIT DIAGRAM



EXNO : 2.b

DATE : 26/08/2022

IDENTIFY OBJECT USING IR AND PIR SENSOR - RASPBERRY-PI

AIM

To design an alert system using PIR sensor to detect motion of object and make buzzer to sound using Raspberry pi.

COMPONENT REQUIRED

1 x Raspberry pi
1 x PIR sensor
1 x BUZZER (5V)
1 x Breadboard
Jumping wires

PIR SENSOR

* passive infrared sensor often referred to as PIR sensor (also IR motion sensor and pyroelectric sensor) are motion detector.

* Basically detect the change in infrared radiation emitted by a person.

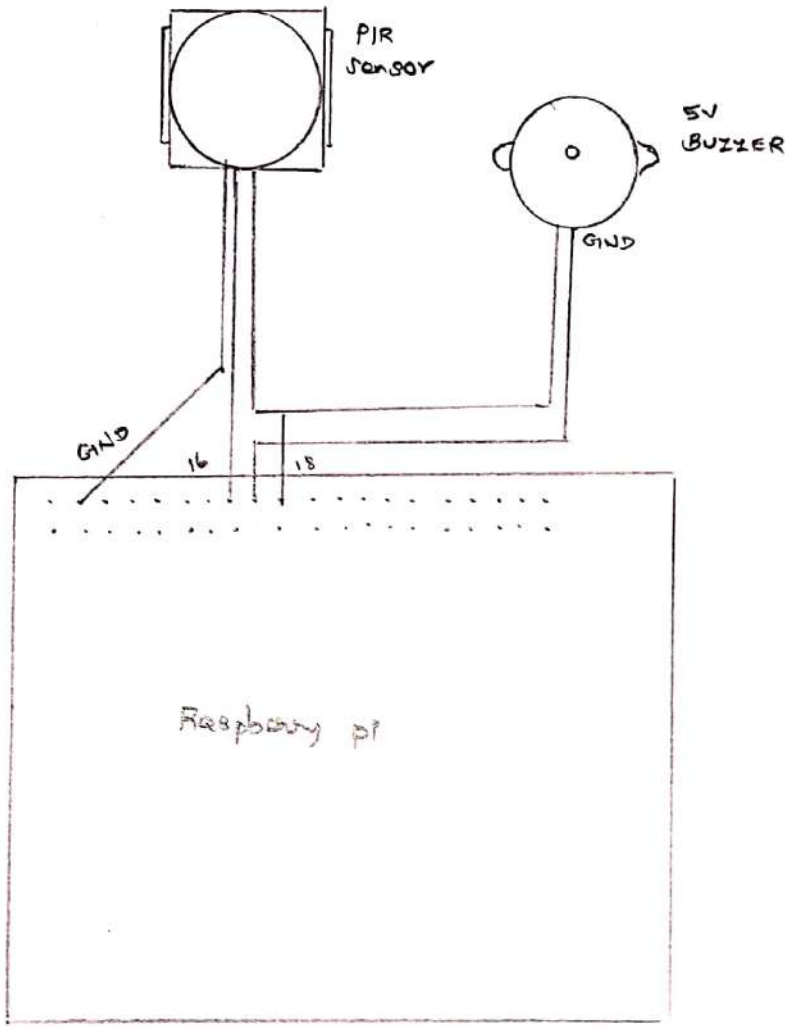
PROCEDURE - CIRCUIT CONNECTION

PIR sensor - +Vcc to 5V of Raspberry pi, GND of Raspberry pi, out to 16 Digital pin.

Buzzer - +ve to Digital pin 18 of Raspberry pi and -ve to GND of Raspberry pi.

If motion is detected by PIR sensor, then the buzzer alarm will activated as output.

CIRCUIT CONNECTION :



EX.NO : 2.c DATE : 26/08/2022	IDENTIFY THE OBJECTS USING IR AND PIR SENSOR - ARDUINO	Page.NO : 24

AIM

TO design an alert system which turn LED when it detect the object with IR sensor using arduino.

IR SENSOR

* An Infrared sensor is an electronic device that emit in order to sense some project aspect of surroundings.

* IR sensor can measure the heat of object as well as detect the motion.

* It is a radiation sensitive upto electronic component with spectral sensitivity in infrared wavelength range 780 nm.

* IR sensor is widely used in motion detectors, used in building service to switch LED in alert system.

COMPONENT REQUIRED

1 X Breadboard
1 X Arduino UNO
1 X LED
1 X IR sensor
Jumping wires

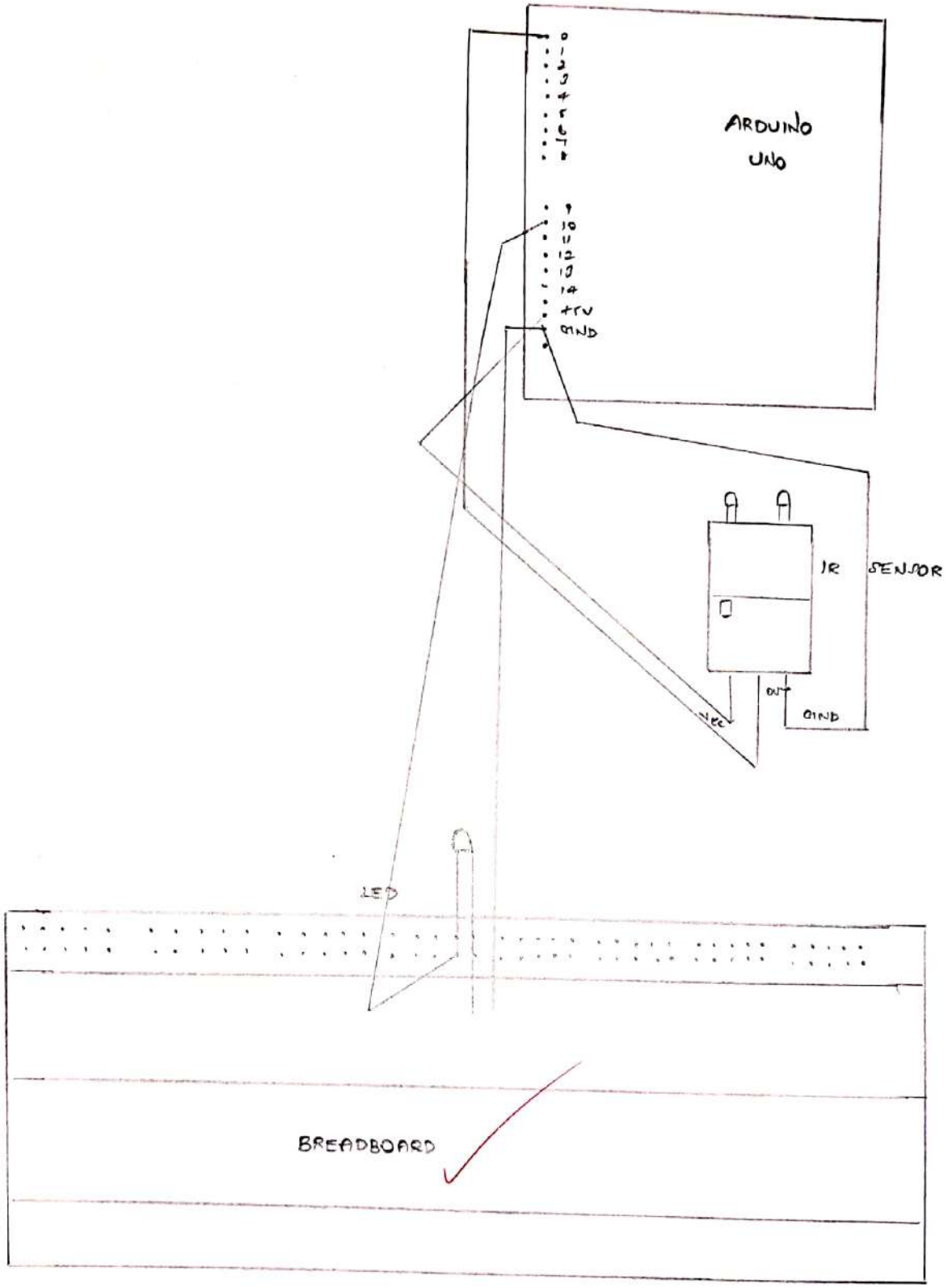
PROCEDURE - circuit connections

IR sensor - out to pin 0 of arduino, + Vcc pin to 5V of arduino
GND of sensor to GND of arduino.

LED - +ve to resistor to 10 digital pin of arduino
-ve to GND of arduino.

If IR sensor detect motion of object, an LED will glows.

CIRCUIT CONNECTION :



EX.NO : 2.d

DATE : 26/08/2022

IDENTIFY OBJECTS USING IR AND PIR SENSOR -RASPBERRY PI

AIM

To design a alert system which turn on red LED if object is far away and turn on green LED if object is near using Raspberry pi.

IR sensor

* Infrared sensor are a specific type of motion sensor that use infrared radiation.
* It is a sensor as a device can detect infrared radiation which is invisible to eye.
* It is a photodiode that is sensitive to an infrared light

COMPONENT REQUIRED

1 x Raspberry pi
1 x IR sensor
1 x Green and Red LED
1 x Breadboard
Jumping wires

PROCEDURE -CIRCUIT CONNECTION

IR sensor - Digital pin 14 to out, +Vcc pin to 5V of raspberry pi, GND of sensor to GND of Raspberry pi.

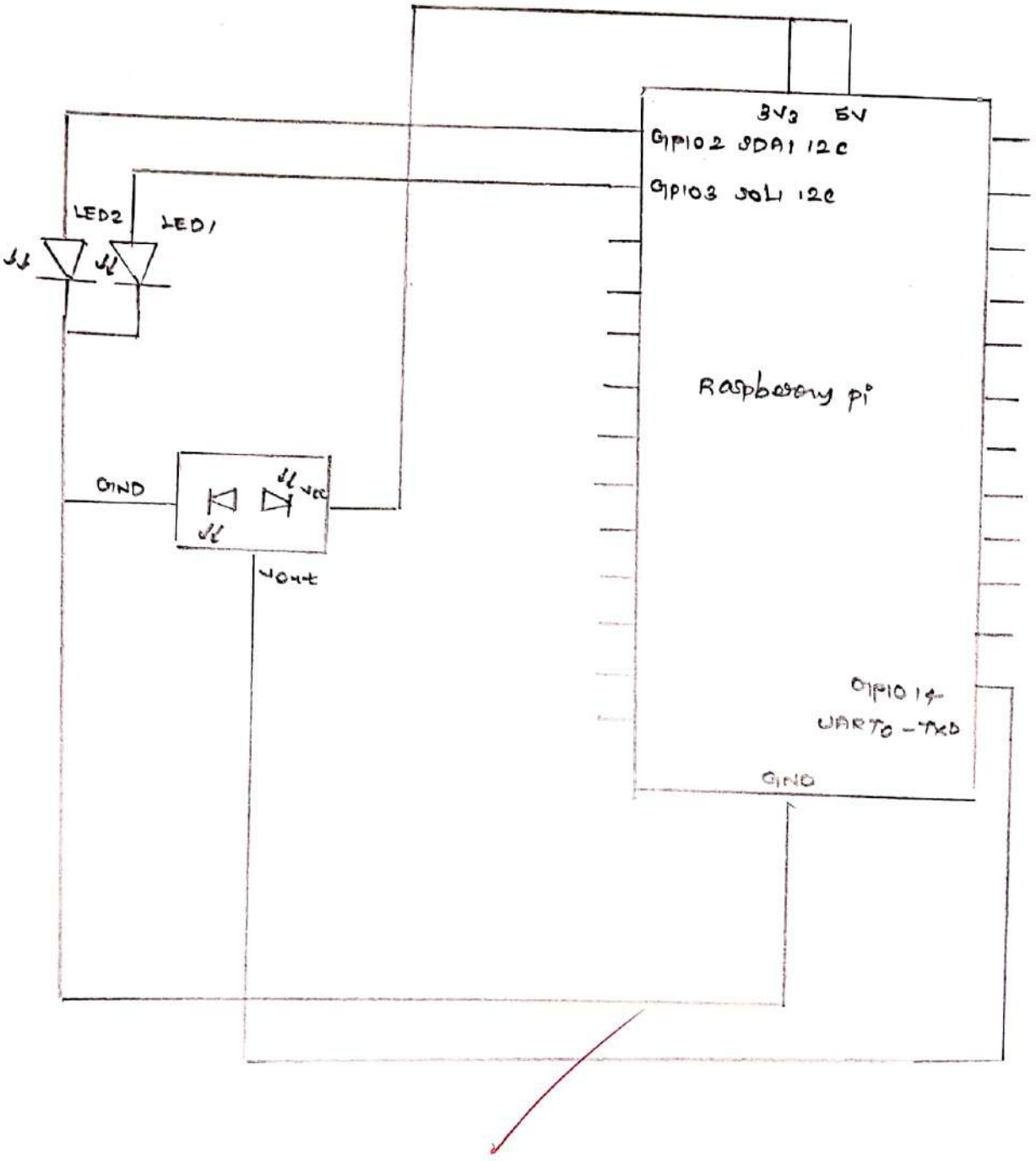
RED LED - +ve to Digital input 2
-ve to GND of Raspberry pi

Green LED - +ve to Digital pin 3
-ve to GND of Raspberry pi

If sensor detect the motion object is far away and it makes Red LED on.

If sensor detect the motion object is near and it make green LED on

CIRCUIT CONNECTION



EX.NO : 3.9

DATE : 02/09/2022

MEASURE THE MOISTURE LEVEL OF SOIL USING SOIL MOISTURE SENSOR - ARDUINO

AIM

To design an simple application using arduino for an agriculture with soil moisture sensor that measure soil measure level and it make the LED to glow.

SOIL MOISTURE SENSOR

* The soil moisture sensor is a kind of sensor used to guage the volumetric content of water within soil.
* It measure volumetric water content not directly with help of some other rule of soil like dielectric constant, electrical resistance.
* The sensor equipped with both analog and digital output

COMPONENT REQUIRED

1 x Arduino UNO

1 x Soil moisture sensor

1 x LED

Jumping wire

PROCEDURE - circuit connection

Soil moisture sensor - GND to GND of arduino, +Vcc to +5V of arduino, SIG to input digital pin 7.

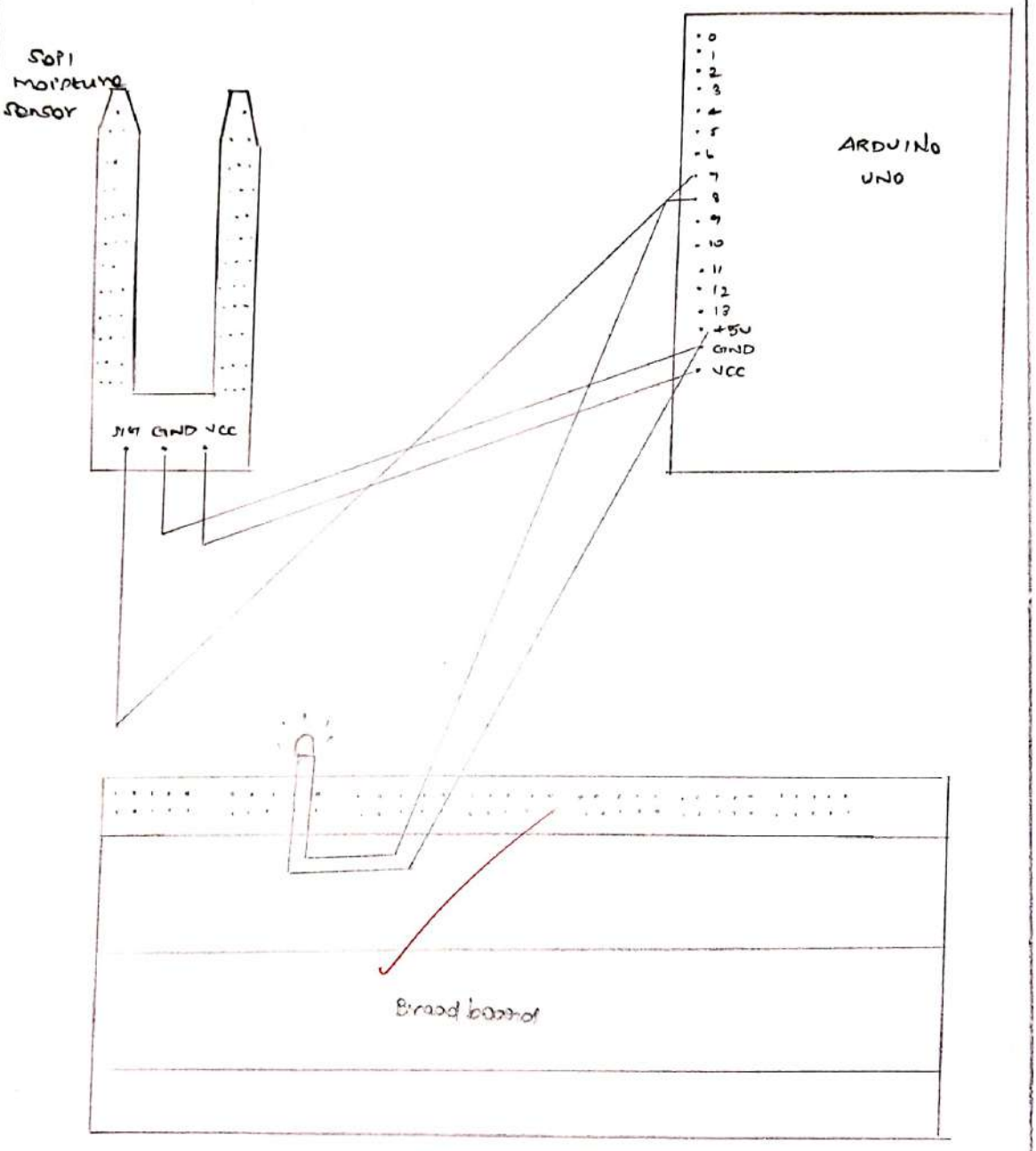
LED - +ve to digital pin 8 of arduino.

-ve to GND of arduino

If the sensor detect the dry moisture content which make LED glow.

If sensor detect the wet moisture content make LED off.

CIRCUIT CONNECTION



EX.NO : 3.6 DATE : 02/09/2022	MEASURE THE MOISTURE LEVEL OF SOIL USING SOIL MOISTURE SENSOR - RASPBERRY PI

AIM

TO measure the soil moisture content using soil moisture sensor in the surrounding using Raspberry pi.

SOIL MOISTURE SENSOR

* The sensor is a simple for moisture measure in soil and its materials.

* Soil measure sensor measure or estimate the amount of water in soil.

* The soil moisture sensor consist of two probe that measure the volume of water in the soil.

* Two probe allow the dielectric current to pass through the soil and according to its resistance measure the moisture level of soil.

COMPONENTS REQUIRED

1 x Raspberry pi

1 x Soil moisture sensor

Jumper wires

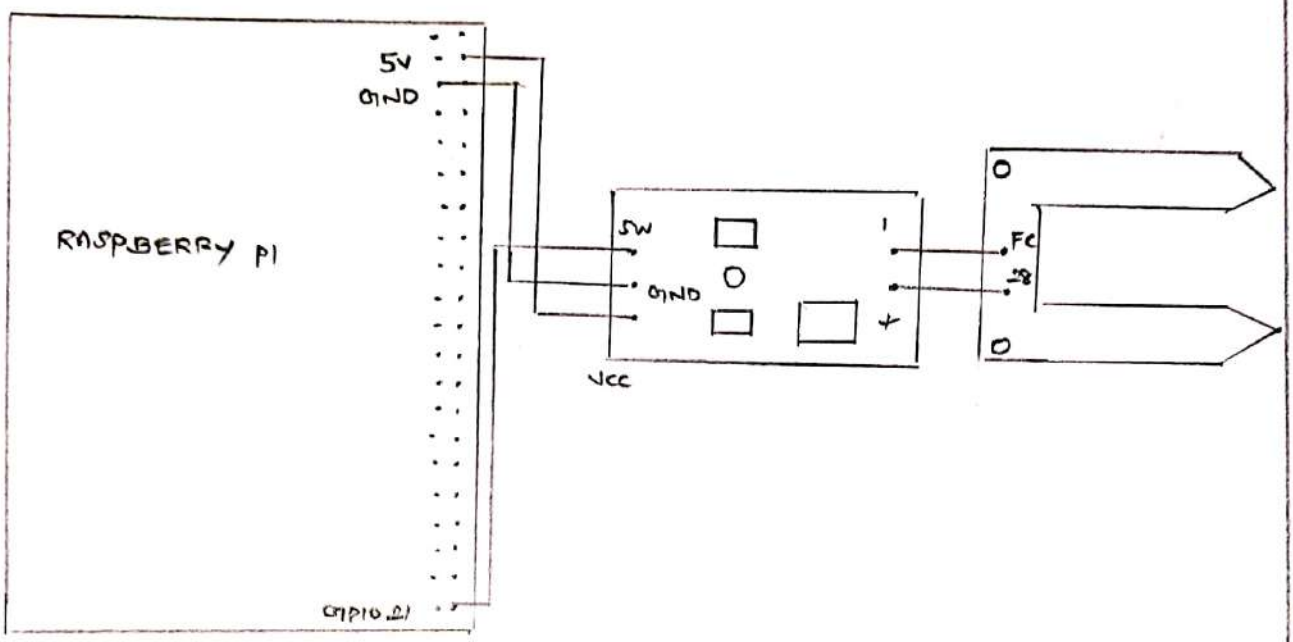
PROCEDURE - CIRCUIT CONNECTION

Soil moisture sensor - +Vcc to 5V, GND to GND, SIG to GPIO 21.

If soil moisture is detected then it will print moisture detected.

Otherwise, it will print no moisture detected.

CIRCUIT DIAGRAM



EX.NO: 4.9 DATE : 09/09/2022	MEASURE DISTANCE BETWEEN ULTRASONIC SENSOR AND THE OBSTACLE -ARDUINO

AIM

To measure the distance between the ultrasonic sensor and the obstacle using arduino UNO.

Ultrasonic sensor

* Ultrasonic sensor uses ultrasonic sound waves to determine the distance of an object.
* It offers excellent non-contact range detection with high accuracy and stable readings in an easy to use package from 2 cm to 400 cm.

COMPONENT REQUIRED

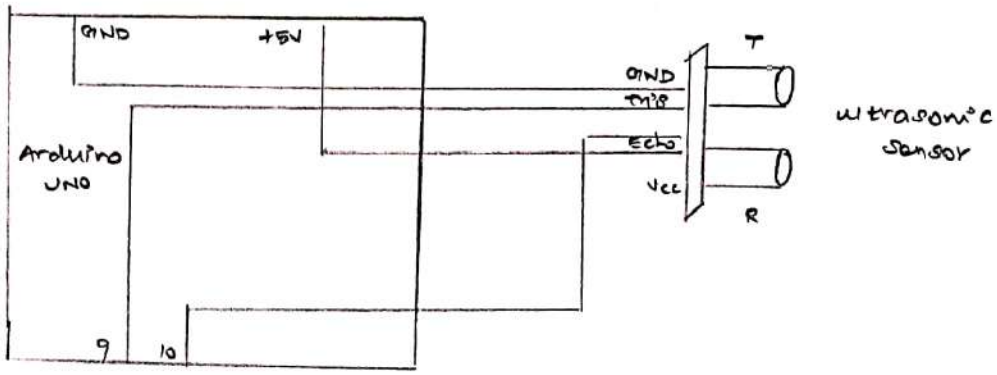
1 x Breadboard
1 x Arduino UNO
1 x Ultrasonic sensor
Jumping wire

PROCEDURE - circuit connection

Ultrasonic sensor - Vcc to 5V pin of arduino
- Trigger of sensor to digital pin 9
- Echo of sensor to digital pin 10
- GCD of sensor with GND of arduino

If obstacle is detected, then the ultrasonic sensor measure the distance and it displays it.

CIRCUIT DIAGRAM



EX.NO: 4.b DATE: 09/09/2022	MEASURE THE DISTANCE BETWEEN ULTRASONIC SENSOR AND THE OBSTACLE - RASPBERRY PI

AIM

To determine the distance between the sensor and obstacle using raspberry pi.

Ultrasonic sensor

The HC-SR04 ultrasonic sensor uses ultrasonic sound waves to determine the distance of an object, it offers an excellent non contact distance detection with high accuracy and stable readings in an easy to use package from 2 cm to 400 cm.

COMPONENT REQUIRED

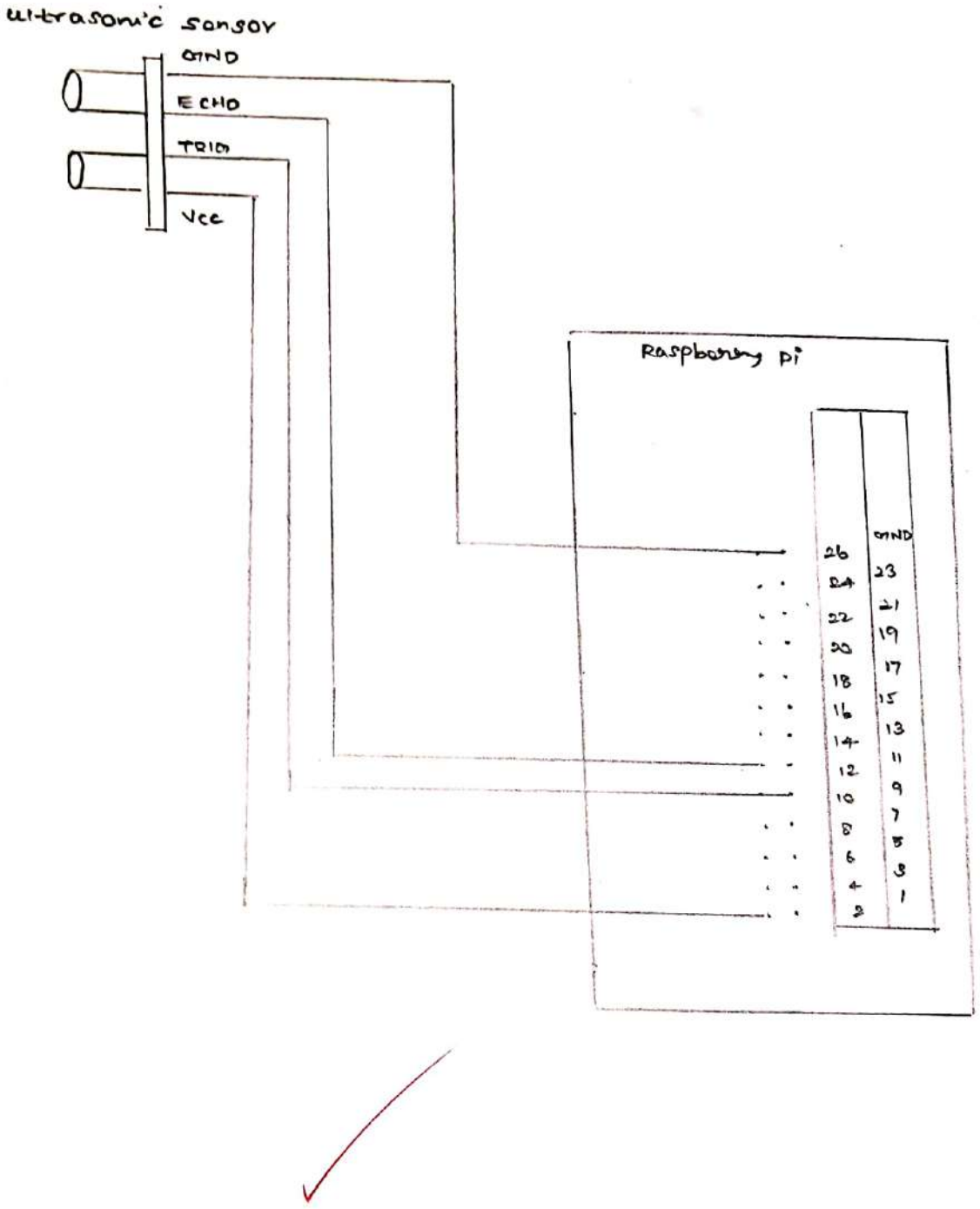
1 x Raspberry pi
1 x Ultrasonic sensor
Jumping wire

Procedure - circuit connection

Ultrasonic sensor - GND to GND of Raspberry pi
- Echo is connected to board of 11th pin
- Trigger is connected to board of 7th pin
- Vcc is connected to 2nd pin of Raspberry pi.

Then obstacles is detected by ultrasonic sensor, after that it measure the distance between sensor and obstacles and it will display it through serial monitor and terminal.

CIRCUIT DIAGRAM



EX.NO: 5.a DATE : 16/09/2022	IDENTIFY THE LEAKAGE OF GAS / SMOKE IN ENVIRONMENT - ARDUINO

AIM

TO determine the smoke and triggor buzzor and also glow LED when smoke level is higher than 130.

SMOKE SENSOR

The smoke sensor is sensitive to smoke and any flammable gas and repeat smoke by voltage level that get is output.

It has potentiometer to adjust the sensitivity to smoke.

COMPONENT REQUIRED

1 X Smoke sensor
1 X LED
1 X BUZZER
1 X Arduino UNO
Jumping wires

PROCEDURE - circuit connection

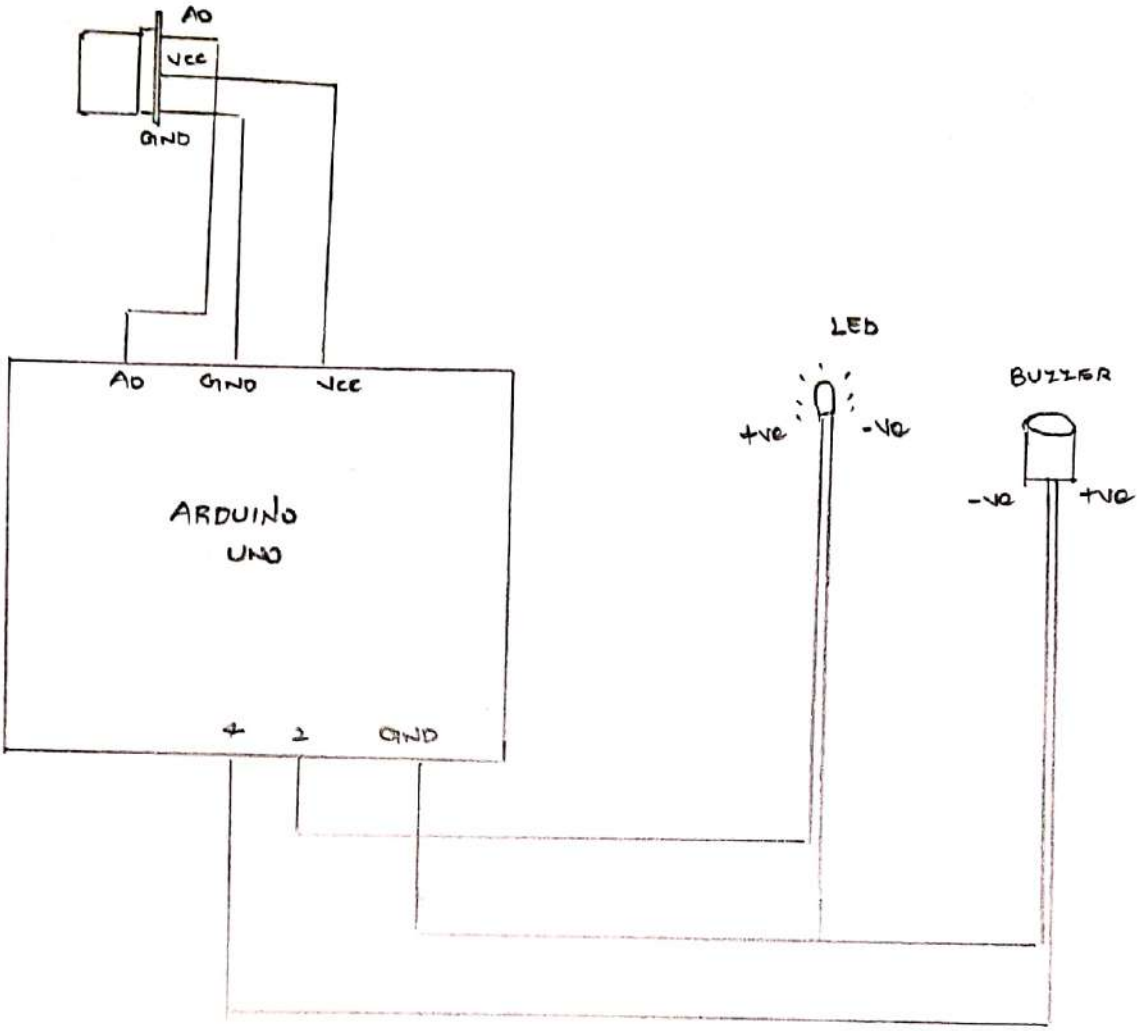
Smoke sensor - GND to GND of arduino
+Vcc to 5V of arduino
-A0 to A0 of arduino

LED - +ve connected to digital pin 2
-ve connected to ground

BUZZOR - +ve connected to digital pin 4
-ve connected to Ground

If smoke is detected, it will make buzzor to sound and LED to glow.

CIRCUIT DIAGRAM)



Ex.No : 5.6 DATE : 16/09/2022	IDENTIFY THE LEAKAGE OF SMOKE / GAS IN ENVIRONMENT - RASPBERRY PI

AIM

To detect the leakage of gas / smoke such as cooking gas in household and notify on alert message on serial monitor.

Smoke sensor

* The smoke sensor is sensitive to smoke and only inflammable gas and reports smoke by the voltage level that is as output.

* It has potentiometer to adjust sensitivity to smoke.

COMPONENT REQUIRED

1 x smoke sensor
1 x Raspberry pi
Jumping wires

Procedure - circuit connections

Smoke sensor - +ve connected to +5V of Raspberry pi
-ve connected to Ground
-s connected to GPIO 2

After that if smoke is detected in smoke sensor, it will notify on alert message "smoke detected" in the terminal and serial monitor.

CIRCUIT DIAGRAM