**EXPERIMENT-5**

**BLUETOOTH**

***THEORY***:-

**BLUETOOTH-** Bluetooth is a wireless technology standard for exchanging data between fixed and mobile devices over short distances using short wavelength UHF radio waves I the industrial, scientific and medical radio bands, from 2.400 to 2.485 GHz and building personal area networks. It has 5 pins Tx, Rx, STATE, GND and EN. And every pin has its different role.

**ARDUINO-** The **Arduino Uno** is an open-source microcontroller board. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts.

**Concept Used: *-***

A circuit is made using Bluetooth and arduino. Tx of Bluetooth is connected to 0 of arduino. Ground of Bluetooth is connected to ground of arduino. And VCC(high voltage) is connected 5V of arduino.

***Learning and Observations: -***

* Making circuits using Arduino and Bluetooth.
* Connecting Bluetooth to arduino.
* Ground is connected to ground.
* Signals are transmitted from Bluetooth to arduino.
* Bluetooth receives the signals by Rx (0).
* Coding to be done on Arduino.exe for stimulation of the experiment.

***Problems & Troubleshooting: –***

* *We have to take at least 4 tries to find the right amount of delay so that one LED glows for the correct time interval .*
* *At first the LED was not working properly so we had to change and put a new LED in its place.*
* *The circuit was not getting closed as the wires were not connected properly so I made sure that the connections were made properly.*
* *The required pattern was not getting created because of some error in the code so I had to change the code as per requirement.*
* *Proper closing of while using loops in the code.*

**Precautions:–**

* *Remember to declare all the ports used in digital input/output in correct way.*
* *Ensure that all wires are working correctly and all connections are tight.*
* *Remember to connect Negative end of device (in this case LED) to GND (ground) in Arduino Uno and positive end of each to a separate digital input output pin.*
* *Set right amount of delay so that circuit performs at its best.*

***Learning Outcomes: –***

1. Setting up circuit on a Arduino.
2. Connecting bluetooth and Arduino.
3. Using Tx and Rx.
4. Working and coding of Arduino.

***Result: –***

Working of Bluetooth and arduino is verified after uploading the program.