**PART-B** **EXPERIMENT NO. : 1**

## RADIUS OF CIRCLE

**Aim:** Python program which accepts the radius of a circle from the user and compute the area Python program which accepts the radius of a circle from the user and compute the area

**Apparatus:** System Installed with Python Software

**Program:**

```
from math import pi

radius = float(input ("Input the radius of the circle : "))

print ("The area of the circle with radius " + str(radius) + "
is: " + str(pi * radius**2))
```

**Output:**

```
Input the radius of the circle : 1.1
The area of the circle with radius 1.1 is: 3.8013271108436504
```

**Result:**

**PART-B** **EXPERIMENT NO. : 2**

## NUMBER OF POSTIVE,NEGATIVE OR ZERO ENTRIES OF GIVEN NUMBER

**Aim:** Write a Python program that asks the user for seven numbers. Then print the total, the number of positive entries, the number entries equal to zero, and the number of negative entries.

**Apparatus:** System Installed with Python Software

**Program:**

```
nums = []
totPositive = 0
totNegative = 0
totZero = 0
print("Enter 10 Numbers: ")
for i in range(10):
  nums.insert(i, int(input()))
for i in range(10):
  if nums[i]>0:
    totPositive = totPositive+1
  elif nums[i]<0:
    totNegative = totNegative+1
  else:
    totZero = totZero+1
print("\nPositive Number: ")
print(totPositive)
print("Negative Number: ")
print(totNegative)
print("Zero: ")
print(totZero)
```

**Output:**

**Result:**

**PART-B** **EXPERIMENT NO. : 3**

## CELSIUS TO FAHRENHEIT

**Aim:** Create a program that asks the user for a temperature in Celsius, and then prints the temperature in Fahrenheit

**Apparatus:** System Installed with Python Software

**Program:**

```
faren=int(input("enter temperature in faranheit"))
cel=((faren-32)*5)/9
print("Temperature in celsius is",cel)
```

**Output:**

```
enter temperature in faranheit98
Temperature in celsius is 36.666666666666664
```

**Result:**

**PART-B** **EXPERIMENT NO. : 4**

## AREA OF A TRAPEZOID

**Aim:** Create a program that will ask the user for the information needed to find the area of a trapezoid, and then print the area.

**Apparatus:** System Installed with Python Software

**Program:**

```
a=int(input("Enter top width"))
b=int(input("Enter base width"))
h=int(input("Enter height of trapezoid"))
area=((a+b)*h)/2
print("Area of trapezoid is",area)
```

**Output:**

```
Enter top width10
Enter base width20
Enter height of trapezoid15
Area of trapezoid is 225.0
```

**Result:**

**PART-B** **EXPERIMENT NO. : 5**

## PRINTS NUMBERS IN DIFFERENT PATTERN

**Aim:** Create a program that prints numbers in different Pattern

**Apparatus:** System Installed with Python Software

**Program:**

```
1. Write a single program in Python that will print the numbers:
k=1
i=10
l=1
l=1
while k<=10:
    j=1
    while j<l:
        print(i,end=" ")
        if i==54:
            break
        i=i+1
        j=j+1
    print(end="\n")
    l=l+1
    if i==54:
        break
```

**Output:**

```
10
11 12
13 14 15
16 17 18 19
20 21 22 23 24
25 26 27 28 29 30
31 32 33 34 35 36 37
38 39 40 41 42 43 44 45
46 47 48 49 50 51 52 53 54
```

**Result:**

**PART-B** **EXPERIMENT NO. : 6**

## LIST AND TUPLE

**Aim:** Write a Python program which accepts a sequence of comma-separated numbers from user and generate a list and a tuple with those numbers.

**Apparatus:** System Installed with Python Software

**Program:**

```
values = input("Input some comma seprated numbers : ")
list = values.split(",")
tuple = tuple(list)
print('List : ',list)
print('Tuple : ',tuple)
```

**Output:**

```
Input some comma seprated numbers : 3,5,7,23
List :  ['3', '5', '7', '23']
Tuple :  ('3', '5', '7', '23')
```

**Result:**

**PART-B** **EXPERIMENT NO. : 7**

## NUMBER OF DAYS BETWEEN TWO DATES

**Aim:** Write Python program to calculate number of days between two dates

**Apparatus:** System Installed with Python Software

**Program:**

```
from datetime import date
f_date = date(2014, 7, 2)
l_date = date(2014, 7, 11)
delta = l_date - f_date
print(delta.days)
```

**Output:**

```
9
```

**Result:**

**PART-B** **EXPERIMENT NO. : 08**

## SWAPING

**Aim:** Write code to swap the values 15 and 14  list = [15,57,14,33,72,79,26,56,42,40]

**Apparatus:** System Installed with Python Software

**Program:**

```
l=[15,57,14,33,72,79,26,56,42,40]
a,b=l.index(15),l.index(14)
l[a],l[b]=l[b],l[a]
print (l)
```

**Output:**

```
[14, 57, 15, 33, 72, 79, 26, 56, 42, 40]
```

**Result:**

# SENSOR INTERFACING PRORAMS WITH NODE MCU

**PART-B** **EXPERIMENT NO. : 09**

## GAS SENSOR INTERACING

**Aim:** To write a program to interface Gas Sensor with Node MCU

**Apparatus:** 1. System Installed with Arduino Software

2. Things Speak Cloud

**Program:**

```
#include <ESP8266WiFi.h>

 #include <WiFiClient.h>

 #include <ThingSpeak.h>

 const char* ssid = "xxxxxxxxxx";

 const char* password = "zzzzzzzzz";

 WiFiClient client;

 unsigned long myChannelNumber =1437349;

 const char * myWriteAPIKey = "EHOXS5VWFLZWJD1E";

 float g;

 int gas;

 void setup()

 {

  Serial.begin(9600);

   Serial.print("Connecting to ");

  Serial.println(ssid);

  WiFi.begin(ssid, password);

  while (WiFi.status() != WL_CONNECTED)

  {
   delay(500);

   Serial.print(".");

  }

  Serial.println("");

  Serial.println("WiFi connected");

  // Print the IP address

  Serial.println(WiFi.localIP());

  ThingSpeak.begin(client);

 }

 void loop()

 {

  gas = analogRead(A0);

  g = gas * 5.0/1023;

  Serial.println(g);

  ThingSpeak.writeField(myChannelNumber,1,g,myWriteAPIKey);

  delay(10000);

 }
```

**Output:**

**Result:**

**PART-B** **EXPERIMENT NO. : 10**

## IR SENSOR INTERFACING

**Aim:** To write a program to interface IR Sensor with Node MCU

**Apparatus:** 1. System Installed with Arduino Software

2. Things Speak Cloud

**Program:**

```
#include <ESP8266WiFi.h>
 #include <WiFiClient.h>
 #include <ThingSpeak.h>
 const char* ssid = "xxxxxxx";
 const char* password = "zzzzzzzz";
 WiFiClient client;
 unsigned long myChannelNumber = 1443079;
 const char*  myWriteAPIKey = "HBLU0B6UM888WVQ0";
 #define LED D4
 #define IR D5
 void setup()
 {
  pinMode(LED,OUTPUT);
pinMode(IR,INPUT);
  Serial.begin(9600);
   Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED)
  {
   delay(500);
   Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  // Print the IP address
  Serial.println(WiFi.localIP());
  ThingSpeak.begin(client);
 }
 void loop()
 {
if(digitalRead(IR)==LOW)
{
  Serial.print("obstacle ahead");
digitalWrite(LED,HIGH);
delay(100);
}
else
{
  Serial.print("No obstacle");
digitalWrite(LED,LOW);
delay(100);
}
 }
```

**Output:**

**Result:**

**PART-B** **EXPERIMENT NO. : 11**

## ULTRASONIC SENSOR INTERFACING

**Aim:** To write a program to interface Ultrasonic Sensor with Node MCU

**Apparatus:** 1. System Installed with Arduino Software

2. Things Speak Cloud

**Program:**

```
#include <ESP8266WiFi.h>
#include <WiFiClient.h>
 #include <ThingSpeak.h>
 const char* ssid = "xxxxxxxxx";
 const char* password = "zzzzzzzz";
 WiFiClient client;
 unsigned long myChannelNumber = 1443079;
 const char * myWriteAPIKey = "HBLU0B6UM888WVQ0";
 #define trig D7
 #define echo D8
 long duration;
 int cm;
 void setup()
 {
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
  Serial.begin(9600);
   Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED)
  {
   delay(500);
   Serial.print(".");
  }
  Serial.println ("");
  Serial.println ("WiFi connected");
  // Print the IP address
  Serial.println(WiFi.localIP());
  ThingSpeak.begin(client);
 }
 void loop()
 {
digitalWrite(trig,LOW);
delayMicroseconds(5);
digitalWrite(trig,HIGH);
delayMicroseconds(10);
digitalWrite(trig,LOW);
duration = pulseIn(echo,HIGH);
cm= duration/29/2;
 ThingSpeak.writeField(myChannelNumber,1,cm,myWriteAPIKey);
Serial.print("value");
Serial.println(cm);
delay(1000);
}
```

**Output:**

**Result:**

**PART-B** **EXPERIMENT NO. : 12**

## LDR SENSOR INTERFACING

**Aim:** To write a program to interface LDR Sensor with Node MCU

**Apparatus:** 1. System Installed with Arduino Software

2. Things Speak Cloud

**Program:**

```
#include <ESP8266WiFi.h>
 #include <WiFiClient.h>
 #include <ThingSpeak.h>
 const char* ssid = "xxxxxxxxxxxxxxxxxxxxxxxxx";
 const char* password = "xxxxxxxxxxxxxxxxxx";
 WiFiClient client;
 unsigned long myChannelNumber = xxxxxxxxxxx;
 const char * myWriteAPIKey = "xxxxxxxxxxxxxxxxx";
 uint8_t l=0;
 int ldr;
 void setup()
 {
  Serial.begin(9600);
   Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED)
  {
   delay(500);

   Serial.print(".");

  }

  Serial.println("");

  Serial.println("WiFi connected");

  // Print the IP address

  Serial.println(WiFi.localIP());

  ThingSpeak.begin(client);

 }

 void loop()

 {

  ldr = analogRead(A0);

  l= ldr * 5.0/1023;

  ThingSpeak.writeField(myChannelNumber,1,l,myWriteAPIKey);

  delay(10000);

 }
```

**Output:**

**Result:**

**PART-B** **EXPERIMENT NO. : 13**

## GPS SENSOR INTERFACING

**Aim:** To write a program to interface GPS Sensor with Raspberry Pi

**Apparatus:** 1. System Installed with Linux OS

2. Things Speak Cloud

**Program:**

```
import serial
import requests
import time
ser  =serial.Serial(“/dev/ttyUSB0”,9600)
link =  “ “
gps = “ “
lat = “ “
lon = “ “
while True:
     gps=””
     gps=ser.readline()
     ifgps.startswith(“SGPGLL”):
          printgps
          lat=gps[7:16]
          lon=gps[20:29]
          lat=”1234”
          lon=”4567”
          print “Lat:”,lat
          print”Long:”,lon
```

**Output:**

**Result:**

**PART-B** **EXPERIMENT NO. : 14**

## PH SENSOR INTERFACING

**Aim:** To write a program to interface PH Sensor with Node MCU

**Apparatus:** 1. System Installed with Arduino Software

2. Things Speak Cloud

**Program:**

```
#define SensorPin A0          // the pH meter Analog output is
connected with the Arduino’s Analog
unsigned long int avgValue;  //Store the average value of the sensor
feedback
float b;
int buf[10],temp;
void setup()
{
  pinMode(13,OUTPUT);
  Serial.begin(9600);
  Serial.println("Ready");    //Test the serial monitor
}
void loop()
{
  for(int i=0;i<10;i++)       //Get 10 sample value from the sensor
for smooth the value
  {
    buf[i]=analogRead(SensorPin);
    delay(10);
  }
  for(int i=0;i<9;i++)        //sort the analog from small to large
  {
    for(int j=i+1;j<10;j++)
    {
      if(buf[i]>buf[j])
      {
        temp=buf[i];
        buf[i]=buf[j];
        buf[j]=temp;
      }
    }
  }
  avgValue=0;
  for(int i=2;i<8;i++)                      //take the average value
of 6 center sample
    avgValue+=buf[i];
  float phValue=(float)avgValue*5.0/1024/6; //convert the analog into
millivolt
  phValue=3.5*phValue;           //convert the millivolt into pH value
  Serial.print("    pH:");
  Serial.print(phValue,2);
  Serial.println(" ");
  digitalWrite(13, HIGH);
  delay(800);
  digitalWrite(13, LOW);
}
```

**Output:**

**Result:**