Homework 4 - Questions

Q.1 Write a program to ask the user to input an alphabet, and print if it is a vowel or a consonant.

Q.2 What is the value of b in each case?

a. bool b = !(((130%5)==1) && ((45-12)>30)) ;
b. bool b = (!(5%3==1));
c. char a='c'; int c=67;
   bool b = (a==c);
d. bool b = (true||false||!true);

Q.3 What will be the output of the following?

```
#include<simplecpp>
main_program
{
        initCanvas();
        float const pi=3.14159;
        Rectangle r(100,100,30,10);
        r.setFill(1);
        repeat(4)
        {
                repeat(5)
                {
                        r.imprint();
                        r.forward(50);
                }
        r.rotate(pi/2);
        r.forward(25);
        }
}
```

Q.4 Correct the syntax for the following conditional statements :

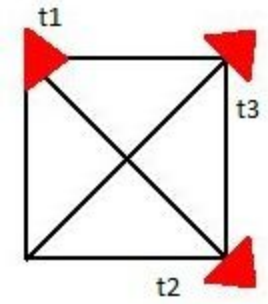
a. if (x=y) cout<<”yes”;
b. if ((34%5>>1)||(x==5))
c. if y==x cout<<”equal”;

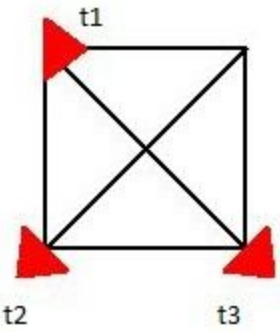
Q.5 What will be the output?

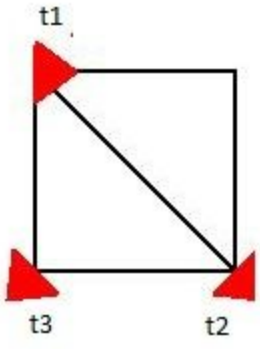
```
#include<simplecpp>
main_program{
        initCanvas("ball",500,500);
        Circle c(400,400,5);
        int x=-1, y=-1;
        repeat(20){
                c.move(x,y);
                y--;
                wait(0.1);
        }
        wait(1);
        int x1 = c.getX(), y1 = c.getY();
        cout<<x1<<" "<<y1;
}
```

Q.6 What will be the output of the following ? Identify which turtle is at which location?

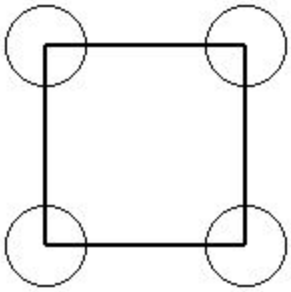
```
#include<simplecpp>
main_program{
        initCanvas();
        Turtle t1, t2, t3;
        repeat(4)
        {
                t1.forward(100);
                t1.right(90);}
                t2.right(45); t2.forward(100*(sqrt(2)));
                t3.penUp(); t3.forward(100); t3.right(135);
                t3.forward(100*(sqrt(2)));
        }
```

a. 

b. 

c. 

Q.7 We have to draw a square of side 100 pixels, which have a circle of radius 20 on all the corners.



Initially we are on top left corner, you have to just fill the blanks in the following program to complete the above diagram.

```
#include<simplecpp>
main_program
{
        initCanvas();
        Circle c1(100, 200, 20);
        double i=c1.getX(), j=.......a........;
        Line l1(i, j, i+100, j );

        Circle c2(....b...., j ,20);
        Line l2(i+100, j ,....c..... , …d…..);

        Circle c3(i+100,.....e....,20);
        Line l3(i+100, j+100, i,....f.........;

        Circle c4(.....g......., j+100, 20);
        Line l4(i, j+100,....h..... , .....k.......);
```

```
        wait(10);
}
```

Q.8 Which are valid/Invalid statements, if it is valid then what should it indicate, If it is invalid then justify it.

a. Rectangle R(200,300,100,500);
   R.rotate(100);
b. Text t1(200,300," Your Name ");
   ti.rotate(100);
   t1.move(100,100);
c. Rectangle R(200,300,textWidth(" Google Drive "),textHeight("google Drive"));
d. Circle c1(0,-10,50);
e. Circle c2(100,100,50);
   c2.setFill(color(256,104,125));

Q.9 Rewrite the following code without using “if”.

```
if (account_type == 1)
        interest=2;
else if
        (account_type == 2) interest=3;
else if
        (account_type == 3) interest= 4;
else if
        (account_type == 4) interest=5;
else if
        (account_type == 5) interest=6;
else
        interest=7;
```

Q.10 What is the value of b in each of the following cases?

a=2,b=2.

a)bool b=((a==b) == TRUE))

b)bool b=(((a==b) == TRUE)) == TRUE)

c)bool b=((((a==b) == TRUE)) == TRUE) == TRUE)

Q.11 Which among the following is the correct expression to check if the variable height stores the value 180?

if height =180
if height ==180
if (height =180)
if (height ==180)

Q.12 What does the program given below do? With the help of this sample program attempt the next question.

```
main_program{
        initCanvas();
        long int p1 = getClick();
        long int p2 = getClick();
        long int p3 = getClick();
        int x=(p1/65536+p2/65536+p3/65536)/3;
        int y=(p1%65536+p2%65536+p3%65536)/3;
        Text t(x,y,"G");
}
```

Q.13 See the following program. It is a simple program of *if else.*

```
#include<simplecpp>
main_program
{
        int i=0,k=5,j=20;
        if(_____)
                cout<<k;
        else
                cout<<j;
}
```

Suppose the above *if condition's blank* is filled by following, What will be the expected output(output will be either 5, or 20 or error)

a. (i=0)
b. (i=-1)
c. (i=1)
d. (5==i)
e. (i=false)
f. (i=true)
g. (i=True)
h. (i=False)
i. (0==i)
j. (1=i)
k. (0=i)
l. (i='m')

Q.14 Program to find the largest number provided by user, Fill in the blank

```
#include<simplecpp>
main_program
{
        int a,b,c;
        cin>>a>>b>>c;
        int largest= ___a__? a : (__b__) ? b : c;
        cout<<largest;
}
```

Q.15 What is the value of b after the following code snippet executes

```
int a = 5;
int b = 0;
switch(a){
        case 1: break;
        case 6:
        case 5: b++;
        case 3: b--; if(b!=0);
        case 0: b++; break;
        case 4: b=9; break;
        default: b=0;
}
```

Q.16 Fill in the blanks to determine whether a given year is leap year or not?

```
#include<simplecpp>

main_program{
    int year;
    cin >> year;
    //Enter code here
    else
        cout << "NOT LEAP";
}
```

Q.17 Fill in the gap with an expression to check if a number is prime. Among the different possibilities which is the most efficient?

```
main_program {
        int x; cin >> x;
        int i = 2;
        factorFound = false;
        repeat (_______) {
                factorFound =((x % i) == 0 );
                i++;
        }
        if (factorFound)
        cout << x << " is not prime" << endl;
}
```

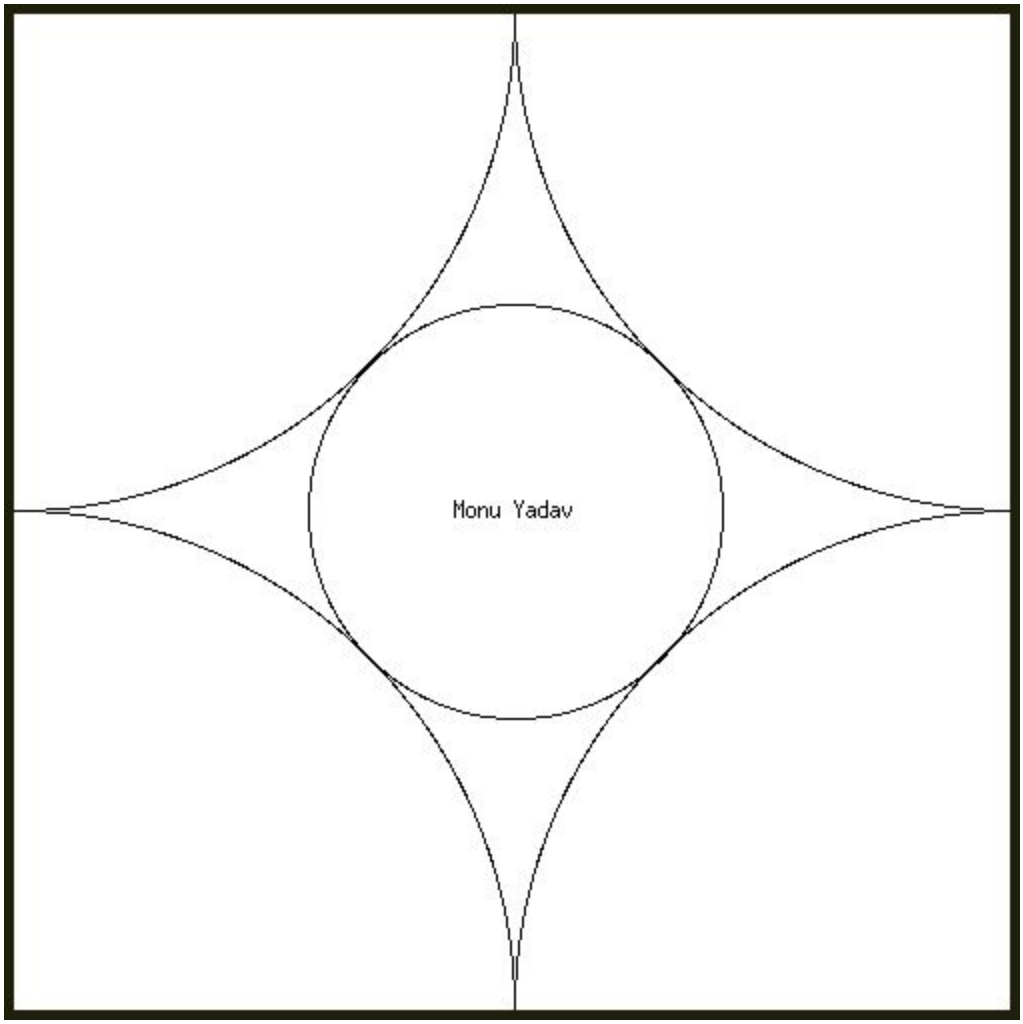
Q.18 What will be the output of following program

```
#include<simplecpp>
main_program
{
        int m=5,n=10,q=20,i=0;
        int a=5,b=10,c=1;
        if((a&&b>c)&&((q/n*m)||i++))
        {
                cout<<"Chapter6, ";
                cout<<" "<<i;
        }
```

```
        else
        {
                cout<<"CS101,";
                cout<<" "<<i;
        }
}
```

a. Chapter6, 1
b. CS101, 1
c. Chapter6, 0
d. CS101, 0

Q.19 You are suppose to draw circles centered at the corners of your Canvas,and one circle of appropriate radius that it touches the all four circles, as shown in the figure



To draw above picture, you have to fill the blanks in following program.

```
#include<simplecpp>
main_program
{
        initCanvas();
        double w=____1_____;
        cout<<w;
        double h=____2_____;
        cout<<h;
        Circle c1(0,__3___, w/2);
        Circle c2(__4__, w, h/2);
        Circle c3(w, __5__, h/2);
        Circle c4(__ 6__,0, w/2);
        Circle c5(w/2,h/2,(____7_____);
        Text t1(w/2,h/2,"Monu Yadav");
        wait(10);
}
```

Q.20 Consider the following 2 code snippets (Not the complete program)

Code Snippet 1

```
  switch ( weather ) {
        case 1:
                cout <<" Grilled " ;
                break ;
        case 3:
                cout <<" Freezed " ;
                break ;
        default :
                cout <<" Room Temperature " ;
  }
```

Code Snippet 2

```
 if ( weather <= 1) {
        cout <<" Grilled " ;
 }
 else if ( weather >= 3) {
        cout << " Freezed " ;
```

```
}
 else {
        cout <<" Room Temperature " ;
  }
```

Which of the following is true for the code snippets given above?

A. For all values of variable “weather”, both code snippets will give same output
B. For all values of variable “weather”, both code snippets will give different output
C. For some values of variable “weather”, both code snippets will give same output
D. None of these

Q.21 Consider the following program :-

```
#include<simplecpp>
main_program{
        int number1=1, number2;
        cin >> number2;
        switch (number1) {
                case 1:
                        cout <<" Happy ";
                case 2:
                        if (number2 < 0 )
                                cout << " Holidays ";
                        if (number2 > 10 && (number2 % 3 == 0) )
                                cout << "Birthday ";
                        if (number2 > 5 && (number2 % 2 == 0) )
                                cout <<"to you ";
                break;
    case 3:
                cout << "Ending ";
                break;
    default:
                cout << " Good luck next time! ";
  }
}
```

If the program is run for values of number2 from 10 to 30, how many times the statement “Happy Birthday to you” will <u>not</u> be printed?

Q.22 Consider the following program

```
#include<simplecpp>
main_program{
        int n ;
        cout << " Give n : " ;
        cin >> n ;
        if ( n < 0) {
                switch ( n ) {
                        case 0:
                                cout << " so " ;
                        case -1:
                                cout << " how is your " ;
                        case -10:
                                cout << " parrot 's " ;
                                break ;
                        default :
                                cout << " cat 's " ;
                }
                cout << " health ? " ;
        }
        else {
                switch ( n ) {
                        case 0:
                                cout << " so " ;
                        case 1:
                                cout << " how is your " ;
                        case 10:
                                cout << " cat 's " ;
                        default :
                                cout << " health ? " ;
                }
        }
        cout << endl ;
}
```

Which of the following strings CANNOT be printed by the above program for any value of the input 'n' ?

A. how is your parrot's health ?
B. so how is your cat's health ?
C. so how is your health ?
D. parrot's health ?
E. None of the choices

Q.23 Consider the following code snippet.

```
if(number1 >= 1)
     cout<<"Good ";

if( (number1 == 1) && (number2 > 2) )
     cout<<"Morning ";

if( (number1 <= 1) && (number2 >= 2) )
     cout<<"Afternoon";

if( (number1 > 1) && (number2 >2) )
     cout<<"Evening";
```

What would be the output of the code snippet given above, if the user entered numerical value '1' for number1 and numerical value '2' for number2?

Q.24 Write a program that takes as input 3 numbers a(assume a!=0), b, c and prints out the roots of the quadratic equation $ax^2 + bx + c = 0$. Make sure you handle all the possibilities of a,b,c(integers, floating numbers). Even if the roots are complex, you should print them out suitably.

Q.25 Write a program to draw the circle inscribing the triangle formed by any three points input by the user.