Homework7 Questions

Q.1)

```
void myFunction( int counter)
{
        if(counter == 0)
                return;
        else
        {
                cout <<counter<<endl;
                myFunction(--counter);
                return;
        }
}
```

How many times is the the statement myFunction(--counter);
encountered?

Q.2) Write a recursive function to print integers from 1 to a given integer n, without using loops.

Q.3)

```
int sum (int num)
    {
        if (num==0)
            return 0;
        return (sum(____i____)+(____ii____));
    }
```

The above function is to return the sum of integers from 1 to a given number, fill in the blanks accordingly.

Q.4) What will be the output of following program, and also find the number of function call?

```
#include<simplecpp>
```

```
void func(int x)
{
        if (x>0)
        {
                cout<<x;
                func(x-1);
        }
}
main_program
{
        func(3);
}
```

Q.5) What will be the output of following program and also count the number of function call of f()?
Make some changes to program to count the number of function calls. (Remember we only know that a function will return only one value.)

```
#include<simplecpp>
main_program{
        int f( int n);
        int a=f(5);
        cout<<a;
}
int f(int n){
        int r=0;
        if (n<=0)
                return 1;
        if (n>3){
                r=n;
                return f(n-2)+r;
        }
        else
                return f(n-1)+r;
}
```

Q.6) Let us define a function as -

```
int func(int x, int y){
        if(x == 0) return y;
        else return func(x-1, y+1);
}
```

What does func(a, b) return, and how many times will it be called?

Q.7) The following function can be used to print numbers from a 1 to n in reverse order. Fill in the blanks.

```
void print(int p)
{
        if (p==__a__) return;
        cout<<p;
        print(__b__);
        return;
}
```

Q.8) The following function checks if a number is prime or not using recursion. Fill in the blank.

```
bool isPrime(int p, int i=2)
{
        if (i==p) return TRUE;
        if (p%i == 0) return FALSE;
        return isPrime(p, __a__);
}
```

Q.9) Fill in the blanks, to swap the values of two input integers.

```
#include<simplecpp>
main_program
{
    int a,b;
    cout << “enter value of a: “; cin>>a;
    cout << “enter value of b: “; cin>>b;
    swap( ___i___ , ___ii___ );
    cout<<a<<”  “<<b;
}

void swap ( _____iii_____, _____iv_____ )
{
   int temp;
   temp= ____v_____;
   ___vi____ = __vii____;
   ___viii____ = temp;
   return;
}
```

Q.10) What will be the output

```
1.  #include<simplecpp>
2.  void square (int *x)
3.  {
4.          *x = (*x + 1) * (*x);
5.  }
6.  main_program
7.  {
8.          int num = 10;
9.      square(&num);
10.     cout << num;
11. }
```

Q.11) Which of the following are valid/Invalid

```
int array[10] = {0, 2, 4, 6, 7, 5, 3};
```

a. `cout<<array[8];`
b. `cout<<array;`
c. `array=1000;`
d.
```
int x; cin>>x;
int ar[x];
```

e.
```
int n;
int ar[n];
cin>>n;
```

f.
```
int *p, *q;
p=q;
```

Q.12) What will be the output of following program

```
#include<simplecpp>
main_program{
        void func(int *a,int *b);
        int i=0, j=1;
        func(&i, &j);
        cout<<i<<j;
}
void func(int *p, int *q){
        p=q;
        *p=2;
}
```

a. 2 2
b. 2 1
c. 0 1
d. 0 2

Q.13) Rewrite the following program after removing the syntactical errors (if any). Underline each correction.

```
#include<simplecpp>
struct Time {
    int hours;
    int minutes;
    int seconds;
 }


 main_program{
     int to_Seconds(Time now);
    Time t1;
    t1.hours = 5;
    t1.minutes = 30;
    seconds.t1 = 45;
    cout << "Total seconds: " <<to_Seconds(t1) << endl;
}
int to_Seconds(Time now){
    return 3600 * now.hours + 60 * now.minutes + now.seconds;
}
```

Q.14)

Will the following program throw compilation error? If not, what is the output.

```
#include <simplecpp>
struct A{
        int a;
} b;
main_program{
        int a = 6;
        b.a = 5;
        cout << a << b.a << endl;
}
```

Q.15) Initially A = 8, B=9, C=10. What are the values of A, B, C after the function call

func(A, B, &C);

```
void func(int x, int &y, int *p){
        int temp = x;
        x = y;
        y = temp;
        temp += *p;
        *p = temp+x;
        x = *p + y;
}
```

Q.16)

```
int arr[5] = {2, 6, 5, 7, 9};
int s = 0;
for (int c = 0; c < 5; c = c + 1)
{   if (arr[c] < 6)
  {       s = s + arr[c];
  }
}
cout << s << endl;
```

What is the output?

Q.17) What is the output?

```
#include<simplecpp>
 main_program{
 int a = 100;
 int b = 200;
 printf("Before swap, value of a : %d\n", a );
 printf("Before swap, value of b : %d\n", b );
 swap(&a, &b);
 printf("After swap, value of a : %d\n", a );
```

```
  printf("After swap, value of b : %d\n", b );
}
```

Q.18) What will be the output?

```
1.  #include <simplecpp>
2.   main_program
3.   {
4.       int array[] = {0, 2, 4, 6, 7, 5, 3};
5.       int n, result = 0;
6.       for (n = 0; n < 8; n++) {
7.           result += array[n];
8.       }
9.       cout << result;
10.  }
```

a) 25 b) 26 c) 27 d) None of the mentioned

Q.19) C++ provides structures, to group different data types together. For example:

```
//example starts here
struct Book {
    char title[50];
    char authors[500];
    double price;
    int accnum;
    int claimantid;
};
//example ends here
```

What can the members of the structures be, from the following 3 options.

a) arrays

b) Variables of other data types

c) Other structures

Q.20) Consider the following code fragment, in which the type declarations T1, T2, T3, T4 and T5 are unspecified.

```
T1 a;
T2 b;
T3 c;
T4 d;
T5 p;

p = &a;
a = *b;
b = &c;
c = *d;
```

Which of the following options will not lead to a compilation error because of mismatched types in assignment statement(s)?

A. T1:int, T2:int*, T3: int**, T4:int***, T5:int*
B. T1:int*, T2:int**, T3: int*, T4:int**, T5:int**
C. T1:int*, T2:int**, T3: int*, T4:int*, T5:int**
D. None of the above