

Computer programming II

Second stage

Function sheet

Q1// write a program in C++ using function that add any two integer numbers

```
#include <iostream>
using namespace std;
int addition (int a , int b)
{
    int r;
    r=a+b;
    return (r);
}
int main ()
{
    int z;
    z=addition(5,3);
    cout<<"the result is "<<z<<endl;
    return 0;
}
```

Q2// write a program in C++ that contains two functions: one performs the multiplication operator and the other performs the division operator.

```
#include <iostream>
using namespace std;

int mul (int a, int b)
{
    return (a*b);
}

float div (float a,float b)
{
    return (a/b);
}

int main ()
{
    int x=5,y=2;
    float n=5.0, m=2.0;
    cout<<mul(x,y)<<endl;
    cout<<div(n,m)<<endl;

    return 0;
}
```

Q3//Write a program in C++ using empty function that will print the sentence "I'm function!".

```
#include <iostream>
using namespace std;
void printmessage ()
{
    cout<<"I'm a function!"<<endl;
}

int main ()
{
    printmessage ();
    return 0;
}
```

Q4// write a program to read four real variables, then use function for finding the largest value between these variables.

```
#include <iostream>
using namespace std;
float large (float x,float y)
{
    if (x>y)
        return x;
    else
        return y;
}

int main ()
{
    float temp1, temp2, max;
    float num1, num2, num3, num4;
    cout<<"Enter Four Real numbers : ";
    cin>>num1>>num2>>num3>>num4;
    temp1=large(num1,num2);
    temp2=large(num3,num4);
    max=large(temp1,temp2);
    cout<< " the largest number :" <<max <<endl;

    return 0;
}
```

Q5//write a program to calculate the square of a number, the square is calculated by using separated function.

```
#include <iostream>
using namespace std;
int square (int x)
{
    return x*x;
}
int main ()
{
    int a,result;
    cout<<"Enter a number"<<endl;
    cin>>a;
    result=square(a);
    cout<<"the sequare is = "<<result<<endl;

    return 0;
}
```

Q6// write a program to calculate the absolute value of real number using function.

```
#include <iostream>
using namespace std;
float absolute (float a)
{
    if (a>=0)
    {
        return a;
    }else
    {
        return -a;
    }
}

int main ()
{
    float x;
    cout<<"Enter a numbers"<<endl;
    cin>>x;
    cout<<"Absolute value of: "<<x<<" is " <<absolute(x)<<endl;

    return 0;
}
```

Q7// write a program to calculate the square root, the square and the absolute value of any number entered by the user using math library functions.

```
#include <iostream>
#include <math.h>
using namespace std;
void main (){
    float a;
    cout<<"Enter value \n";
    cin >>a;
    cout<<"the square_root is= "<<sqrt(a)<<endl;
    cout<<"the square is = "<<pow(a,2)<<endl;
    cout<<"the absolute is= "<<fabs(a)<<endl;
}
```

Q8//write program to calculate and print the value of the function at the real value x,

$$f(x) \begin{cases} \sqrt{3 - \cos 2x} & \text{if } x \geq 0 \\ x^3 - e^x & \text{if } x < 0 \end{cases}$$

```
#include <iostream>
#include <math.h>
using namespace std;
float f (float x)
{
    if (x>=0)
    {
        return (sqrt(3-cos(2*x)));
    }else
    {
        return (pow(x,2)-exp(x));
    }
}
void main (){
    float x;
    cout<<"Enter real value: \n";
    cin >>x;
    cout<<"f("<<x<<" )="<<f(x)<<endl;
}
```

Q9// Write a program in C++ to find the maximum value between two numbers (a=100, b=200) using a function named (max) and print the result.

```
#include <iostream>
using namespace std;
int max(int num1, int num2)
{
    if (num1 > num2)
        return num1;
    else
        return num2;
}
int main ()
{
    int a = 100;
    int b = 200;
    int ret;
    ret = max(a, b);
    cout << "Max value is : " << ret << endl;
    return 0;
}
```

Q10// Write a program in C++ to swap the value of two numbers (a=100, b=200) using a function named (swap)

```
#include <iostream>
using namespace std;
void swap(int x, int y)
{
    int temp;
    temp = x;
    x = y;
    y = temp;
}
int main ()
{
    int a = 100;
    int b = 200;
    cout << "Before swap, value of a :" << a << endl;
    cout << "Before swap, value of b :" << b << endl;
    swap(a, b);
    cout << "After swap, value of a :" << a << endl;
    cout << "After swap, value of b :" << b << endl;
    return 0; }
}
```

Q11// write program by C++ language to find the root of integer number enter by user?

```
#include <iostream>
#include <math.h>
using namespace std;

float root (int a)
{
    float y;
    y=sqrt(a);
    return y;
}

void main ()
{
    int x=0;
    cout<< "Enter an integer number to find its root \n";
    cin>>x;
    cout<<root(x)<<endl;
}
```

Q12// Find factorial of integer number enter by user $n!=(n)(n-1)(n-2)\dots(1)$

Ex. $5!=(5)*(4)*(3)*(2)*(1)=120$

```
#include <iostream>
#include <math.h>
using namespace std;

int factorial (int n)
{
    int f=1;
    for (int i = 1; i <=n; i++)
    {
        f=f*i;
    }
    return f;
}

void main ()
{
    int x=0;
    cout<< "Enter an integer number to find its factorial \n";
    cin>>x;
    cout<<factorial(x)<<endl;
}
```

Q13// Write program in C++ to check the number if it's even or odd?

```
#include <iostream>
#include <math.h>
using namespace std;

void even_odd (int n)
{
    if (n%2==0)
        cout<<"even\n";
    else
        cout<<"odd\n";
}

void main ()
{
    int x=0;
    cout<< "Enter an integer number to check if even or odd \n";
    cin>>x;
    even_odd(x);
}
```

Q14// Write a program to calculate the average of three students in four subjects
The degrees are interred by the user and then print the average result

	1 st subject	2 nd subject	3 rd subject	4 th subject
1 st student	75	56	85	65
2 nd student	89	78	85	86
3 rd student	65	58	63	72

```
#include <iostream>
using namespace std;
```

```
float avg (float d1, float d2, float d3, float d4)
{
    return (d1+d2+d3+d4)/4;
}

int main()
{
    float a,b,c,d;
    for (int i = 1; i < 4; i++)
    {
        cout<<"Enter the degrees of student "<<i<< endl;
        cin>>a>>b>>c>>d;
        cout<<"The average is= "<<avg(a,b,c,d)<<endl;
    }

    return 0;
}
```


Q15// Find the average for five marks by using array

The marks are 87,67,81,90,55

```
#include <iostream>
#include <math.h>
using namespace std;

float avg (int n[])
{
    float s=0;
    for (int i = 0; i < 5; i++)
    {
        s+=n[i];
    }
    return s/5;
}

void main ()
{
    int x[5]={87,67,81,90,55};

    cout<<avg(x)<<endl;
}
```