Lecture 1

Example (1):-Write program define a function to find and print value of square any number.

Solution:-

```cpp
#include <iostream>
using namespace std;
double sqr(double);
int main()
{
   cout << "5^2=" << sqr(5)<<endl;
   return 0;
}
double sqr(double a)
{
   return a*a;
}
```

Example (2):-Write program define a function to compute power of any integer number.

Solution:-

```cpp
#include<iostream>
using namespace std;
long power (int base,int exp)
{
   int pw=1;
   for(int i=0;i<exp;i++)
      pw*=base;
   return pw;
```

}

int main()

{

   cout<<"power of 2^8="<<power(2,8)<<endl;

   int x,y;

   cout<<"read value of x and y:\t";

   cin>>x>>y;

   cout<<"the power x^y="<<power(x,y);

   cout<<"\n power of x^5="<<power(x,5);

   return 0;

}

Example (3):-Write program define function to compute the power from the equation. $Y=\dfrac{X^2}{2} - \dfrac{X^4}{4} + \dfrac{X^6}{6} - \ldots\ldots + \dfrac{X^n}{n}$

Solution:-

#include<iostream>

using namespace std;

long power (int base,int exp)

{

   int pw=1;

   for(int i=0;i<exp;i++)

     pw*=base;

   return pw;

}

int main()

{

   int x,n,r=1;

   double y;

```
cin>>x;

cin>>n;

for(int i=2;i<=n;i+=2)

{

   y+=(power(x,i)/i)*r;

 cout<<"\n the result value y\t"<<y;

 r*=-1;

}

 return 0;

}
```

Example (4):-Write program to find the value of Z, where Z=$\frac{X!+y!}{(X+y)!}$,

define a function to compute factorial.

Solution:-

```
#include<iostream>

#include<conio.h>

using namespace std;

int fact(int);

int  main()

{

   int x,y;

   double z;

   cout<<"enter value of x,y"<<endl;

   cin>>x>>y;

   z=(float)fact(x)+fact(y)/(x+y);

   cout<<"\n the value of z=\t"<<z;

   getch();

}
```

```cpp
int fact(int x1)
{
   int f=1;
   for(int i=1;i<=x1;i++)
      f*=1;
   return f;
}
```

Example (5):-Write program to exchange values of two numbers.

Solution:-

```cpp
#include<iostream>
using namespace std;
void swap(int *a,int*b);
int main()
{
   int num1=5,num2=20;
   cout<<"num1 before swapping is:"<<num1<<endl;
   cout<<"num2 before swapping is:"<<num2<<endl;
   swap(&num1,&num2);
   cout<<"num1 after swapping is:"<<num1<<endl;
   cout<<"num2 after swapping is:"<<num2<<endl;
}
void swap(int*a,int*b)
{
   int temp;
   temp=*a;
   *a=*b;
   *b=temp;
}
```

Example (6):-Suppose you have pairs of numbers in your program and you want to be sure that the smaller one always precedes the larger one. To do this you call a function, order(), which checks two numbers passed to it by reference and swaps the originals if the first is larger than the second.

Solution:-

```cpp
#include<iostream>
using namespace std;
void order(int&numb1,int&numb2)
{
    if(numb1>numb2)
    {
        int temp=numb1;
        numb1=numb2;
        numb2=temp;
    }
}
int main()
{
    int n1=99,n2=11;
    int n3=22,n4=88;
    order(n1,n2);
    order(n3,n4);
    cout<<"n1="<<n1<<endl;
    cout<<"n2="<<n2<<endl;
    cout<<"n3="<<n3<<endl;
    cout<<"n4="<<n4<<endl;
    return 0;
}
```

Example (7):-Write program define three functions first to read arrays A(7) ,B(7), second to find Z=A+B, third to print A,B,Z.

Solution:-

```
#include<iostream>

#include<conio.h>

using namespace std;

int const n=7;

void sum(int x1[n],int x2[n],int *x3);

void read(int *y);

void print(int *y);

int main()

{

    int A[n],B[n],Z[n];

    cout<<"\n read matrix A";

    read (A);

    cout<<"\n read matrix B";

    read (B);

    cout<<"\n z=a+b"<<endl;

    sum(A,B,Z);

    cout<<"n print A:"<<endl;

    print(A);

    cout<<"n print B:"<<endl;

    print(B);

    cout<<"n print Z:"<<endl;

    print(Z);

    getch();

}

void read(int*x1)

{
```

```
    for(int i=0;i<n;i++)

        cin>>x1[i];

}

void sum(int x1[n],int x2[n],int*x3)

{

  for(int i=0;i<n;i++)

        x3[i]=x1[i]+x2[i];


}

void print(int*x)

{

    for(int i=0;i<n;i++)

        cout<<" "<<x[i];

}
```

Example (8):-Write program using functions first one to read an array (3*4), second function to print an array.

Solution:-

```
#include<iostream>

using namespace std;

int const n=3, m=4;

void read(int xn[n][m])

{

    for(int i=0;i<n;i++)

        for(int j=0;j<m;j++)

        cin>>xn[i][j];

}

void print(int x[n][m])

{

    for(int i=0;i<n;i++)
```

```cpp
    {
        for(int j=0;j<m;j++)
        cout<<""<<x[i][j];
        cout<<endl;
    }
}
int main()
{
    int x[n][m];
    cout<<"\n read matrix x";
    read(x);
    cout<<"\n print A:"<<endl;
    print(x);
}
```