Introduction to C++
Sheet (4)

❖ problems about LO3 for Understanding C++ functions and arrays :

➢ Question (1) : problems about C++ arrays :

a) Write a C++ program to find the sum and average of one dimensional integer array.

b) Write a C++ program to swap first and last element of an integer 1-d array.

c) Write a C++ program to reverse the element of an integer 1-D array.

d) Write a C++ program to find the largest and smallest element of an array.

➢ Question (2) : Find the output of the following program:

```
#include <iostream>
using namespace std;
void Changethecontent(int Arr[], int Count){
for (int C=1;C<Count;C++)
Arr[C-1]+=Arr[C];
}
int main(){
int A[]={3,4,5},B[]={10,20,30,40},C[]={900,1200};
Changethecontent(A,3);
Changethecontent(B,4);
Changethecontent(C,2);
for (int L=0;L<3;L++){
cout<<A[L]<< "#";
cout<<endl; }
for (int L=0;L<4;L++){
cout<<B[L] << "#" ;
cout<<endl; }
for (int L=0;L<2;L++){
cout<<C[L] << "#" ;
cout<<endl;}
return 0;
```

➢ Question (3) : problems about C++ functions :

a) Write a function to calculate the factorial value of any integer as an argument. Call this function from main( ) and print the results in main( ).

b) Write a function called smaller() that has two integer arguments being passed by reference and sets the smaller of the two numbers to 0. Write the main program to access the function.

c) **Raising a number to a power p is the same as multiplying n by itself p times. Write a function called power that takes two arguments, a double value for n and an int value for p, and return the result as double value. Use default argument of 2 for p, so that if this argument is omitted the number will be squared. Write the main function that gets value from the user to test power function.**

d) **Write a program that lets the user perform arithmetic operations on two numbers. Your program must be menu driven, allowing the user to select the operation (+, -, *, or /) and input the numbers. Furthermore, your program must consist of following functions:**

1) **Function showChoice: This function shows the options to the user and explains how to enter data.**
2) **Function add: This function accepts two number as arguments and returns sum.**
3) **Function subtract: This function accepts two number as arguments and returns their difference.**
4) **Function mulitiply: This function accepts two number as arguments and returns product.**
5) **Function divide: This function accepts two number as arguments and returns quotient.**

➢ Question (2) : Find the output of the following program:

a)

```
#include <iostream>
using namespace std;
void fun(int &A, int &B)
{
        A = A + B;
        B = A - B;
        A = A - B;
}
int main()
{
        int a = 4, b = 18;
        fun(a,b);
        cout << a << ", " << b;
        return 0;
}
```

b)

```
#include <iostream>
using namespace std;
void implement (int &B, int C = 100){
     int temp = B + C;
     B += temp;
     if (C == 100)
          cout << temp << " " << B << " " << C << endl
}
int main(){
     int M = 90, N = 10;
     implement(M);
     cout << M << " " << N << endl;
     implement(M, N);
     cout << M << " " << N << endl;
     return 0;
}
```

c)

```
using namespace std;
static int i = 100;
void ABC()
{
     static int i = 8;
     cout << "first = " << i++ << endl;
}
int main()
{
     static int i = 2;
     ABC();
     cout << "second = " << i << endl;
     ABC();
     return 0;
}
```

d)

```
#include <iostream>
using namespace std;
int func(int &x, int y = 10){
     if (x % y == 0)
          return ++x;
     else
          return y--;}
int main(){
     int p = 20, q = 23;
     q = func(p, q);
     cout << p << " " << " " << q << endl;
     p = func (q);
     cout << p << " " << " " << q << endl;
     q = func (p);
     cout << p << " " << " " << q << endl;
     return 0;}
```