



Answer Sheet

Student ID:

Student Name:

Part A (5 marks):

State whether the following are *true (T)* or *false (F)*.

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Answer	T	T	F	F	F	T	T	T	F	T

Q1. Function `display_comment()` doesn't send data to the function and doesn't receive any.

Q2. `#include<...>` is used to include predefined function.

Q3. An array can store many different types of values.

Q4. Array declaration `int list[25];` will create 26 elements.

Q5. An array subscript can be of data type `double`.

Q6. Any source-code file that contains `int main()` can be used to execute a program.

Q7. A class can have multiple constructors with different parameters.

Q8. A structure contains members of different data types.

Q9. Variables declared in the body of a particular member function are known as data members and can be used in all member functions of the class.

Q10. Data members or member functions declared with access specifier `private` are accessible to member functions of the class in which they're declared.

Part B (12 marks):

Find the output of these following programs.

<pre>#include <iostream> using namespace std; struct MyBox { int length,breadth,height; }; void dimension (MyBox M) { cout << M.length << "x" << M.breadth << "x"; cout << M.height << endl; } int main () { MyBox B1 = {4,5,6}, B2, B3; B1.height++; dimension(B1); B3 = B1; ++B3.length; B3.breadth++; dimension(B3); B2 = B3; B2.height += 5; B2.length--; dimension(B2); return 0; }</pre>	<pre>#include <iostream> using namespace std; class Rectangle { int width, height; public: Rectangle() { width=1; height=2; } void set_values (int,int); int area() { return width*height; } }; void Rectangle::set_values (int x, int y) { width = x; height = y; } int main () { Rectangle rect,rect1; rect.set_values (3,4); cout << "area: " << rect.area()<<endl; cout << "area: " << rect1.area(); return 0; }</pre>
<p>Output: (3 marks)</p> <pre>4x5x7 5x6x7 4x6x12</pre>	<p>Output: (3 marks)</p> <pre>area: 12 area: 2</pre>

<pre>#include <iostream> using namespace std; int whatIsThis(const int c[],const int d[], int p); int main() { int x; int a[5]={1,2,3,4,5}; int b[5]={5,4,3,2,1}; x = whatIsThis(a,b,5); cout<< "Result is "<< x; return 0; } int whatIsThis(const int c[],const int d[], int p) { int s=0; for(int i=0;i<p;i++) s=s+c[i]*d[i]; return s; }</pre>	<pre>#include <iostream> using namespace std; int main() { int A[]={6,7,9,12,15,22}; for(int i=0;i<6;i++) { if(A[i]%2==0) A[i]+=3; else if(A[i]%3==0) A[i]-=5; if(A[i]%5==0) A[i]*=2; } for(int i=0;i<6;i++) cout<<A[i]<<"#"; return 0; }</pre>
<p>Output: (3 marks) Result is 35</p>	<p>Output : (3 marks) 9#7#4#30#20#50#</p>

Part C (23 marks):

Question 1: (6 marks)

Write a C++ Program to sort numbers from lowest to highest of 7 entries (entered by user) using an array.

Sample Run:

```
Enter an integer in the position 1: 12
Enter an integer in the position 2: 15
Enter an integer in the position 3: 4
Enter an integer in the position 4: 8
Enter an integer in the position 5: 2
Enter an integer in the position 6: 17
Enter an integer in the position 7: 10
The ordering array is: 2    4    8    10    12    15    17
```

```

#include<iostream>
using namespace std;
const int N=7;
int main()
{
int a[N],i,nb,tmp;
for(i=0;i<N;i++)
{
cout<<"Enter an integer in the position "<<i+1<<" : ";
cin>>a[i];
}
do
{
nb=0;
for(i=0;i<N-1;i++)
if(a[i]>a[i+1])
{
tmp=a[i];
a[i]=a[i+1];
a[i+1]=tmp;
nb++;
}
}
while(nb!=0);
cout<<"the ordering array is :";
for(i=0;i<N;i++)
cout<<a[i]<<"\t";
return 0;
}

```

Question 2: (7 marks)

Write a program on C++ to create a **Point** using *structure* and give abscissa and ordinate of a point in the plane. Create **two objects** and a **function** that compute the distance of type double and arguments two objects.

Hint: distance from $A(x_A, y_A)$ to $B(x_B, y_B) = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2}$.

Sample Run:

```

Enter x=3
Enter y=0
Enter x=0
Enter y=4
The distance between (3,0) and (0,4) is: 5

```

```

#include<iostream>
#include<cmath>
using namespace std;
struct Point
{
    double x;
    double y;
};
Point read_point()
{
    Point p;
    cout<<"Enter x=";
    cin>>p.x;
    cout<<"Enter y=";
    cin>>p.y;
    return p;
}
void print_point(Point p)
{
    cout<<"("<<p.x<<","<<p.y<<")";
}
double distance(Point p1,Point p2)
{
    return sqrt(pow((p1.x-p2.x),2)+pow((p1.y-p2.y),2));
}
int main()
{
    Point a1,a2;
    a1=read_point();
    a2=read_point();
    cout<<"The distance between ";
    print_point(a1);
    cout<<" and ";
    print_point(a2);
    cout<<" is: "<<distance(a1,a2);
    return 0;
}

```

Question 3: (10 marks)

Write a C++ program to create a **class student** with the following specification

Private members of class student

id	integer
name	string
English, math, science	integer

Public member function of class student

<i>student()</i>	Default constructor.
<i>Take_data()</i>	Function to accept values for id, name, English, math and science.
<i>Show_data()</i>	Function to display all the data members on the screen.
<i>total()</i>	Function to calculate English + math + science with integer return type.

Sample Run:

```
How many students in your section:3
Enter Id number:1437
Enter student name: Mohamed
Enter marks in English, math, science: 20
18
19
Enter Id number:1438
Enter student name: Salah
Enter marks in English, math, science: 14
15
13
Enter Id number:1439
Enter student name: Faisal
Enter marks in English, math, science: 11
10
8
Your data is:
ID:      Name:      English:  Math:      Science:  Total:
1437    Mohamed      20       18         19        57
1438    Salah        14       15         13        42
1439    Faisal       11       10         8         29
```

```

#include<iostream>
#include<string>
using namespace std;
class student
{
private:
    int id;
    string name;
    int eng,math,science;
public:
    student() //Default constructor
    {
        id=0;
        name='x';
        eng=0;
        math=0;
        science=0;
    }
    void Take_data()
    {
        cout<<"Enter Id number:";
        cin>> id;
        cout<<"Enter student name: ";
        cin>>name;
        cout<< "Enter marks in english, math, science: ";
        cin>>eng>>math>>science;
    }
    int ctotal()
    {
        return eng+math+science;
    }
    void Show_data()
    {
        int total=ctotal();
        cout<<id<<"\t"<<name<<"\t"<<eng<<"\t"<<math<<"\t"<<science<<"\t"<<total;
    }
};
int main ()
{
    int N;
    cout<<"How many students in your section:";
    cin>>N;
    student obj[N] ;
    for(int i=0;i<N;i++)
    obj[i].Take_data();
    cout<<"Your data is: "<<endl;
    cout<<"ID: \t Name : \t English: \t Math: \t Science: \t Total: "<<endl;
    for(int i=0;i<N;i++)
    {
        obj[i].Show_data();
        cout<<endl;
    }
    return 0;
}

```

