

Number:

Name:

Q1	Q2	Q3	Q4	Q5	Q6	Total

PRECEDENCE AND ASSOCIATIVITY TABLE

Operators	Associativity
() [] -> .	Left to right
! ++ -- + - * & (type)	Right to left (Unary)
* / %	Left to right
+ -	Left to right
< <= > >=	Left to right
== !=	Left to right
&&	Left to right
	Left to right
?:	Right to left
= += -= *= /= %=	Right to left
,	Left to right

Q1) [10pts] A C++ program contains the following declarations and initializations.

```
int m = 10, n = 2;
double x = 2.0, y = 0.5;
```

Evaluate the following C++ expressions:

$(m-3*n) \% (m/(n+1))$

$((m>n*5) \&\& (y<x*2))$

$(-m+n+1)/x$

$(!(m<n) || (m==n))$

$n/3*n/x+y$

Q2) [20pts] Trace the following programs and write the output in the space provided below.

<pre>#include <iostream> using namespace std; int main() { int k=0, x=0; for (k=1; k<7; k++) { if (k%3 == 2) x=x+k; else x=2*x; cout << x << " "; } return 0; }</pre>	<pre>#include <iostream> using namespace std; int main() { int k=0, m=0, x=0; for (k=1; k<=3; k++) { for (m=0; m<k; m++) { if (k%2 == 0) x++; else x--; cout << x << " "; } } return 0; }</pre>
Output :	Output :

<pre>#include <iostream> using namespace std; int main() { int k=0, x=0; while (k<4) { switch ((k+x) % 4) { case 0: case 1: x = x + 2; break; case 2: x = x - 1; break; default: x = x * 2; } cout << x << " "; k++; } return 0; }</pre>	<pre>#include <iostream> using namespace std; int main() { int k=4, x=0; do { if (x==1) x=3; else if (x==2) x=1; else x=2; cout << x << " "; x--; k--; } while (k>0); return 0; }</pre>
Output :	Output :

Q3) [15pts] Write a C++ function that will calculate and display the real roots of the quadratic equation

$$ax^2 + bx + c = 0$$

using the quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Assume that a , b , and c are double arguments whose values are given, and that x_1 and x_2 are double local variables. Also, assume that $b^2 > 4ac$, so that the calculated roots will always be real.

(b) [5 pt] Write a C++ main() function together with all the necessary #include directives and declarations to find the roots of $2x^2 + 3x + 1 = 0$ using the function you defined above.

Q4)[15pts] Write a C++ program that asks the user to enter a letter grade, then it will display one of the following messages.

Letter typed by the user	Message displayed
'A' or 'a'	Excellent
'B' or 'b'	Very Good
'C' or 'c'	Average
'D' or 'd'	Poor
Any other character	Wrong input

```
#include<iostream>
using namespace std;
int main(){
char grade;
cout<<"Enter a letter grade >";
cin>>grade;

//Perform the required task
```

```
return 0;}
```

Q5) [20pts] Complete the following C++ code that reads the elements of a one-dimensional integer array and will do the following:

- Finds and prints the average of the array elements.
- Finds and prints the minimum element of the array. A sample run can be

```
Enter the array elements: 3 2 7 5 1
The average of the array is 3.6
The minimum element of the array is 1
```

```
#include <iostream>
using namespace std;
#define N 5
int main()
{int Sum=0, Minimum, i;
float Average;
// Declare an integer 1-D array named as A with N elements
    ---
    cout<<"Enter the array elements:";
// Read the array elements from the keyboard
    ---
    ---
// Find the sum of the array elements
    ---
    ---
// Find the average of the array
    ---
// Find the minimum element of the array
    ---
    ---
    ---
    ---
// Print the output
    cout<<"The average of the array is "<<Average<<endl;
    cout<<"The minimum element of the array is "<<Minimum<<end;
```

```
return 0;}
```

Q6) [15pts] Complete the following C++ code that finds the volume of a cylinder with radius R and height H ($V = \pi * R^2 H$).

```
#include<iostream>
using namespace std;
class Cylinder{public:
    double R, H, V;
};

int main()
{const double PI=22.0/7.0;
// Declare object Cylinder1 of type Cylinder
    ---
// Read the values of R and H members of Cylinder1 object
    ---
// Compute the value of member V of Cylinder1 object
    ---
// Print the value of member V of Cylinder1 object
    ---
return 0;
}
```