Sample Paper 1

1. a) Name the header file for the following built-in identifiers:
   i) log10()   ii) getch()   iii) gets()   iv) endl   v) sqrt()   vi) cos()

   b) Find syntax error(s), if any and rewrite the complete the program after making the necessary changes (**underline the errors**):
   ```cpp
   #include iostream.h
   void ()
   {
       int n, sum = 0;
       cin > n;
       If(n>=6)
           sum ++ c;
       cout << 'Sum=' << sum << endl;
   }
   ```

2. a) Give the output of the following program:
   ```cpp
   #include<iostream.h>
   void main()
   {
           int x = 3, y = 4, z = 2;
           x += x + y + z;
           y += x + 2 * y + z;
           z += x + y + 3 * z;
           cout << x << ',' << y << ',' << z << endl;
           x *= y;
           y *= z;
           z += x;
           cout << x << ',' << y << ',' << z << endl;
   }
   ```

   b) Give the output of the following program:
   ```cpp
   #include<iostream.h>
   void main()
   {
       int a=1,b;
       cout<<a<<endl;
       a+=2 ;
       cout<<a<<endl;
       a++;
   ```

```
        cout<<(a+1)<<endl;
        cout<<(2*a-1)<<endl;
        a+=5;
        cout<<a<<endl;
        cout<<(a+2);
    }
```

c) Give the output of the following program segment:
    int a=35;
    cout << ++a << ',' << a++ << ',' << a++ << endl;
    cout << a-- << ',' << --a << ',' << --a << endl;

d) Give the output of the following program:
```
    #include<iostream.h>
    void main()
    {
        int x = 7, y = 5, z = 11;
        x += y += z += x += y += z;
        cout << x << ',' << y << ',' << z << endl;
        z += x + y;
        y += z + x;
        x += y + z;
        cout << x << ',' << y << ',' << z << endl;
    }
```

3. a) Write the following expressions in C++:

    i) $\dfrac{\sin x + \cos x}{\tan x + \cot x}$ ii) $\dfrac{\sqrt{a} + \sqrt{b}}{\sqrt{a-b}}$ iii) $\dfrac{\log_{10} x - \log_{10} y}{\log_{10}(x-y)}$ iv) $\dfrac{\left| a^2 - b^2 \right|}{(a+b)^2}$

    b) i) Name **two** operators that work as unary and as well as binary operator.
        ii) Name any **two** operators that works from right to left other than =.
        iii) Name the **two** operators that are used to combine two or more logical expression.
        iv) Name any **two** operators that works from left to right other than >> and <<.

    c) Name any **three** rules for naming a C++ identifier? Identify **three** incorrect identifier
        names and explain why, from the list given below:
        long, AD_No, INT, comp-sc, CAL29, 2ndfloor, price, cell#

    d) Identify the data type of constants / expressions given below:
        i)   30.0/4   ii)   "30.4/4"   iii)   30/4   iv)   '4'

    e) How many bytes of memory will be allocated to variable of the type:
        i)   **char**   ii)   **int**   iii)   **float**   iv)   **double**

    f) Mention **two** differences between data type **float** and data type **double**.

    g) Write C++ statements to show the use of C++ type modifiers with the fundamental data types
        of **int** and **char**.

    h) Name the type modifiers of C++. Name the type modifiers that can be used with data
        type **float** and **double**.

4. a) What is token? Write **two** differences between keyword and built-in identifier.

    b) What is type casting? With suitable examples show **two** ways of type casting

    c) Write C++ logical expression for the following (do not use any C++ built-in functions):
        i)   To check that a character variable mychar contains only digit
        ii)   To check that an integer variable number is odd but not divisible by 5
        iii) To check that an integer variable marks contains a value between 0 and 100
        iv)   To check that a character variable alpha contains uppercase vowel

    d) What is a comment? With suitable examples show **two** ways of writing comment.
    e) Differentiate between Syntax Error & Run Time Error with example
    f) What is pre-processor directive? Two examples

5. **Write complete C++ program for the following:**
    a) Input a character from a keyboard. Display the inputted character and character type (Uppercase, Lowercase, Digit and Special character) on the screen.   Do not use any built-in functions from the header file <ctype.h>.

    b) Input name of a student (string of 20 characters) and Computer Science marks out 100. Calculate grade (Grade is to be stored in a character type variable) on the basis of the table given below:

Marks	Grade
Greater than equal to 95	A
Greater than equal to 85 and less than 95	B
Greater than equal to 60 and less than 80	C
Greater than equal to 60 and less than 50	D
Greater than equal to 40 and less than 50	E
Less than 40	F
Greater than 100 or less than 0 (zero)	Error

Display inputted name and marks and calculated grade. If inputted marks is less than 0 (zero) or more than 100 then display an error message "Error".

    Write complete C++ program for the following:
    a) Local calls are charged according to the table given below:

Local Calls	Charges for Local Calls
1 – 100	No charge
101 – 250	Rs. 3.00 per call + Rs. 10.00 as surcharge
251 – 500	Rs. 4.00 per call + Rs. 25.00 as surcharge
501 and above	Rs. 5.00 per call + Rs. 75.00 as surcharge

Monthly Phone Rent is Rs. 250, for International Calls charge is Rs. 50 per call. Total Amount Due is calculated as Monthly Phone Rent + Charges for Local calls + Charges for International calls. Input number of local calls (integer value) and number of international calls (integer value) is made in a month. Calculate total amount due and display the result on the screen.

    b) Input three coefficient of a quadratic equation and calculate discriminant. If discriminant is zero then display a message "Real and Equal Roots"; calculate two roots and display the two roots on the screen. If discriminant is positive then display a message "Real and Distinct Roots"; calculate two roots and display the two roots on the screen. If discriminant is negative then display a message "Complex Roots" and do not calculate two roots.