This question paper contains 4 printed pages]

Roll No. ☐☐☐☐☐☐☐☐☐☐☐

S. No. of Question Paper : **8825**

Unique Paper Code : **234101/251305**   C

Name of the Paper : **CSHT-101/CS-I : Programming Fundamentals/**
                              Fundamentals of Programming Languages

Name of the Course : **B.Sc. (Hons.) Computer Science I Semester/**
                              B.Sc. (Hons.) Electronics III Semester

Semester : **I/III**

Duration : **3 Hours**   Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

There are *two* parts in the question paper.

Part I : **All** its questions are compulsory.

Part II : Attempt any *four* questions out of five.

Part I

Question No. **1** is compulsory.

1. (*a*)   What is the difference between Global and Local variables ?   2

    (*b*)   Explain the use of 'this' keyword.   2

    (*c*)   Discuss basic data types in C++. Give *one* example of each.   3

    (*d*)   How is Data Hiding achieved in C++ ?   3

    (*e*)   Why should constructor be public member of class ?   3

    (*f*)   Distinguish between the construct 'struct' and 'union'. Give suitable example.   3

    (*g*)   Is it possible to access private data members without using member function ? Justify
             your answer by giving suitable example.   3

    (*h*)   Where do we use virtual functions ? Give its applications.   4

    (*i*)   What are static variables and static functions ? How are static variables initialized ? What
             is the purpose of static variables and static functions ?   4

    (*j*)   What is Copy constructor ? Identify the conditions in which copy constructor is called.
             Explain with suitable examples.   4

P.T.O.

(k) Convert the following numbers :

(i) $(63.125)_{10}$ to binary form

(ii) $(111111001110)_2$ to hexadecimal form. 4

Part II

Attempt only *four* questions from this part. *All* questions carry equal marks.

2. (a) Define an enumeration type 'month' with the name of months of a year as its members.Initialize each to the number of days in the corresponding month.Use the minimum number of assignments on the definition. Assume 28 days in February. 3

(b) Write a function to delete an element at kth position from a given array. Display the resultant compact array. 3

(c) Give output of the following :

```
class myclass
    {
    public:
        int who;
        myclass(int id)
        {
            who = id;
            cout<< "Initializing" << who;
        }
        ~myclass()
        {
            cout<<"Destructing who";
        }
    }    obj1(1), obj2(2);
void main()
{
myclass obj3(3);
cout<< "This is C++ Program";
}
```
4

3. (a) Write a function to calculate and display the sum of only negative integers when N integers including positive, negative or zero value, are entered.   4

(b) Consider the following class :

class Box

{

    int length, breadth, height;

    . . . . .

    . . . .

};

Write member functions to overload unary decrement operator '--' that decrements the corresponding length, breadth and height of a Box. Write code for both prefix and postfix versions of the same.   6

4. (a) Write a program to determine square of a given number. Use function overloading to calculate square of integer, float or double depending on the type of input passed.   4

(b) Assume a class D derived from a base class B. Class B is a friend of class A. Can class D access private data of class A ? Justify your answer.   3

(c) Identify the error(s) in the following code :

class A

{

private :int x;

protected :int y;

public :int z;

};

Class B : public A

{

private :int u;

protected :i

```
public :int w;
};
void main(void)
{
A obj1;
B obj2;
Obj1.x=1; Obj1.y=2; Obj1.z=3;
Obj2.x=11; Obj2.y=12; Obj2.z=13;
Obj2.u=14; Obj2.v=15; Obj2.w=16;
}
```
3

5. (a) Write complete program in C++ to append the contents of one file to another file. 6

   (b) Write a function that handles the exception "divide by a negative number", allowing the user to correct the error. 4

6. (a) Given the following declarations :

   int a =5, b = 7;

   int *p = &a, *q = &b;

   What is the value of each of the following expressions :

   (i)   ++a

   (ii)   ++(*p)

   (iii) --(*q)

   (iv)   --b
   2

   (b) What is meant by call by value and call by reference ? Give *one* example of each. Under what conditions is call by reference preferred over call by value ? 4

   (c) If str1 and str2 are C++ strings, write a code fragment to find the last occurrence of the first four characters of str1 in str2. 4