This question paper contains 8+4 printed pages.

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **7796**

Unique Paper Code : **2341101** **F-1**

Name of the Paper : **Programming Fundamentals [DC–1.1]**

Name of the Course : **B.Tech. in Computer Science**

Semester : **I**

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

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

There are *two* parts of the question paper Part I and Part II. Part I has one question which is compulsory. From Part II attempt any *four* out of six questions.

Part I

Question No. **1** is compulsory.

1. (*a*) Determine which of the following are valid identifiers. If invalid, state reason : 2

(*i*) recordl

(*ii*) return

(*iii*) name and address

(*iv*) file-3

P.T.O.

(b) If originally x = 3 and y = 5, 2

(i) What is the value of the expression x++ + ++y ?

(ii) What are the values of x and y after the evaluation of the above expression ?

(c) Give the output of the following : 2

(i)
```
int i1 = 123;
float f1 = 23.5, f2 = 12.09;
cout <<setw(6)<<i1;
cout.setf(ios: :fixed, ios: :floatfield);
cout<<setprecision(1);
cout.setf(ios: :left, ios: :adjustfield;
cout<<setw(6)<<f2;
cout<<"%";
cout.setf(ios: :right, ios: :adjustfield);
cout<<setw(6)<<f1;
```

(*ii*) int list [6] = {0}; 3

```
for (int i = 0; i < 3; i ++)
   list [2*i+1] = i + 2;
for (i = 0; i < 6; i ++)
   cout <<list [i] << endl;
```

(*iii*) int k = 20; 2

```
(k ! = (k = – – k)) ? cout << "true" : cout <<"false";
```

(*iv*) class A 3

```
{
   public:
      A( )
      {cout<<"class A constructor";}
      ~A ( )
      { cout <<" class A destructor";}
};
```

P.T.O.

```
class B
{
   public :
   B ( )
   { cout <<"class B constructor";}
   ~B ( )
   {cout<<"class B destructor";}
};
class C : public B, public A
{
   public :
   C( )
   {cout<<"class C constructor";}
   ~C( )
   {cout<<"class C destructor";}
};
int main ( )
{
C myc;
return 0;
}
```

(*d*) Give the output of line 1, line 2 and line 3 : 3

```
class A
{
    int a;
    protected:
    int b;
    public :
    A ( ) {a = 10; b = 20;}
    int c;
    void display ( )
    { cout <<"Hello Class A";}
};
class B : public A
{
public :
void display ( )
{ cout <<"Hello Class B";}
```

P.T.O.

```
void show ( )
{
cout <<a;          //line 1
cout <<b;          //line 2
}
};
int main( )
{
b myb;
myb.show( );
myb.display ( );       //line 3
return 0;
}
```

(e) Write a program that prints the following pattern : 3

```
*
* *
* * *
* * * * *
* * * * * *
```

Input to the program is the number of lines.

(*f*) Change the following do while loop to while loop : 3

```
int x = 0;
do
{
    cout << x ++ <<endl;
} while (x < 100);
```

(g) Find the error in the following function definition : 1

(*i*)
```
void func (int x, int y)
{
   int z;
   return z;
}
```

(*ii*)
```
obj & operator + (obj ob)
{
obj k;
k.val = val + ob.val;
return k;
}
```
2

P.T.O.

(*h*) What would be printed in the following ? 3

(*i*)
```
bool b;
string s1 ("Hello");
string s2 ("Hello!");
b = (s1 = = s2);
cout <<b << endl;
```

(*ii*)
```
string s1 ("Hello");
string s2 ("Hello!");
int i = s1.compare(0,3,s2,0,3);
cout<<i<<endl;
```

(*iii*)
```
string s1 ("Good Morning");
s1.replace(5, 7, "Evening",0,7);
cout<<s1<<endl;
```

(*i*) What is the role of the generic exception handler, catch(....). Give an example. 3

(*j*) What do the following file handling keywords do ? Explain each with syntax : 3

ifstream, ofstream, fstream.

Part II

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

2. (*a*) Given a class employee, given the code for the following :

(*i*) Create an array of 5 employee objects. 2

(*ii*) Give the prototype of non-member function *display* to which the array is passed.

Function display returns void. 2

(*b*) Input an array A containing 10 integers. Write a function to reverse the elements of array A so that last element becomes first, second from the last becomes the second and so on. 4

(*c*) Write a function called smallest that, given *three* integers, returns the smallest one. 2

3. Create a class fraction containing data members ***num*** and ***deno*** (num denotes numerator and deno denotes denominator) and appropriate methods mentioned below : 3

(*a*) A default constructor to accept data members. 2

P.T.O.

(*b*) The copy constructor. 2

(*c*) A member function to add two objects of fraction using operator overloading. 3

4. (*a*) Create a file containing roll no., name, marks in 3 subjects of 5 students. Create another file using this file which contains the data of those students whose average marks >=40. Print the contents of both the files. 5

(*b*) Write a program to find the average of n integer numbers. Read the value of n. If n happens to be zero, throw a user defined exception with message "input error". Also catch the exception using suitable try and catch block. 5

5. (*a*) (*i*) Write a base class *base*, with a pure virtual function *print*. 2

(*ii*) Derive a class *derived* with public inheritance. Override *print*. 2

(*iii*) Overload the print method in the derived class with a single integer parameter to print the parameter. 1

(*b*) (*i*) What is run time polymorphism ? How is it achieved ? 2

(*ii*) Differentiate between static binding and dynamic binding. 3

6. (*a*) Explain the difference between pass-by-value and pass-by-reference techniques to pass the data to function. Also give a suitable example of each. 5

(*b*) Differentiate between constants and variables. Give example. 3

(*c*) Write appropriate declarations for the following : 2

(*i*) unsigned integer variable : custno

(*ii*) double precision variable : c = 0.3333333

7. (*a*) (*i*) Create an array of 12 strings to store the 12 months in a year. 2

(*ii*) Use string function(s) to create a string that appends the first 3 months. 1

(*iii*) For the last 4 months search and report the position of substring "ber" using string class function. 2

(*b*) Determine the value of the following expressions when i=8, j=5, x=0.005, y=–0.01, c='c' 3

(*i*) (3*i – 2*j)%(2*j – i)

(*ii*) !(c= =99)

(*iii*) (x>y)&&(i>0)||(j<5)

P.T.O.

(*c*) Give the output of the following code : 2

```
void fun(int& a, int & b, int c)
{
    b=a+2;
    cout<<"in function a = "<< a <<" b = "<<b <<endl;
}
int main ( )
{
    int x;
    x = 5;
    fun (x, x, x);
    cout <<"in main"<<x<<endl;
    return 0;
}
```