ROLL NO. _____

Code: DE70/DC56 Subject: OBJECT ORIENTED PROGRAMMING WITH C++

DIPIETE – ET/CS

Time: 3 Hours **DECEMBER 2014** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. A function call mechanism that passes arguments to a function by passing a copy of the values of the arguments is _____

(A) call by name **(B)** call by value
(C) call by reference **(D)** call by value result

b. The address of a variable temp of type float is

(A) *temp **(B)** &temp
(C) float& temp **(D)** float temp&

c. If a class C is derived from class B, which is derived from class A, all through public inheritance, then a class C member function can access

(A) protected and public data only in C and B
(B) protected and public data only in C
(C) private data in A and B
(D) protected data in A and B

d. Data members which are *static*

(A) cannot be assigned a value **(B)** can only be used in static functions
(C) cannot be defined in a *Union* **(D)** can be accessed outside the class

e. How many constructors can a class have?

(A) 0 **(B)** 1
(C) 2 **(D)** any number

f. A struct is the same as a class except that

(A) there are no member functions
(B) all members are *public*
(C) cannot be used in inheritance hierarchy
(D) it does have a *this* pointer

g. Run Time Polymorphism is achieved by _____

(A) friend function
(B) virtual function
(C) operator overloading
(D) function overloading

h. The keyword *friend* does not appear in

(A) the class allowing access to another class
(B) the class desiring access to another class
(C) the private section of a class
(D) the public section of a class

i. The operator that cannot be overloaded is

(A) ++
(B) ::
(C) ( )
(D) ~

j. Exception handling is targeted at

(A) Run-time error **(B)** Compile time error
(C) Logical error **(D)** All of these

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Discuss the fundamental features of the object oriented programming. **(6)**

b. What are the rules and significance of declaring identifiers? Give some examples of valid and invalid identifiers. **(5)**

c. With the help of an example, describe 'size of ' operator. **(5)**

Q.3 a. Define array. Give the syntax for defining an array. With the help of syntax and example, explain how single-dimensional array can be initialized at definition time. **(8)**

b. Write the syntax for accessing structure members in C++. Also construct a structure called *"Student"* whose members are roll no, name, branch and marks. Use this structure in your program that will read student information and then display that information. **(8)**

Q.4 a. Write the conditions that must be satisfied for function calling. **(4)**

b. Write a class called "Student" with data members (*char* name, *int* rollnumber, *int* marks). Write appropriate inline member functions to enter and access the student data. Write a member function to calculate the average marks for a student and print it on the console. **(12)**

Q.5 a. What is the use of constructor in C++? List any four properties of constructor. **(6)**

b. Why is destructor function required in a class? **(4)**

c. Explain the syntax for overloading a unary and binary operator using appropriate examples. **(6)**

Q.6 a. What is Inheritance? What are the rules that must be kept in mind while deciding whether to define members as private, protected, or public? **(8)**

b. List some of the benefits of Inheritance using appropriate examples/code. **(4)**

c. What would be the output of the following code? **(4)**

```
#include <iostream.h>

class BC {

public:

BC(int a){
        cout<<"\nOne-argument constructor in base class\n";
}
};

class DC : public BC {

public:
DC(int d) : BC(d){
        cout<<"\nOne-argument constructor exists in derived Class\n";
}

};

void main(){
DC objD(3);
}
```

Q.7 a. Explain the term Polymorphism. In what situation Virtual destructors are used? **(6)**

b. Create a class "number" to store an integer number and the member function read() to read a number from console and the member function div() to perform division operations. It raises exception if an attempt is made to perform *divide-by-zero* operation. It has an empty class name DIVIDE used as the throw's expression-id. Write a C++ program to use these classes to illustrate the mechanism for detecting errors, raising exceptions, and handling such exceptions. **(10)**

Q.8 a. Explain template. Write a program using function template to find the cube of a given integer, float and a double number. **(8)**

b. What are the rules adopted by compiler for selecting a suitable template when the program has overloaded function templates? **(4)**

c. What is Class Template? Give the syntax for declaring class template. **(4)**

Q.9 a. Explain the following giving syntax /examples: **(4×2)**
(i) put() and get() functions
(ii) getline() and write() functions

b. Write a C++ program to display the contents of a file on the console, where filename is entered interactively. **(8)**