DIPIETE – ET/CS (NEW SCHEME) – Code: DE70 / DC56

Subject: OBJECT ORIENTED PROGRAMMING WITH C++

Time: 3 Hours   Max. Marks: 100

DECEMBER 2011

NOTE: There are 9 Questions in all.

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **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. Object-Oriented Technology's use of _____ facilitates the reuse of the code and architecture and its _____ feature provides systems with stability, as a small change in requirements does not require massive changes in the system:

(A) Encapsulation; inheritance   **(B)** Inheritance; polymorphism
(C) Inheritance; encapsulation   **(D)** Polymorphism; abstraction

b. Which one of the following will read a character from the keyboard and will store it in the variable c?

(A) c = getc();   **(B)** getc(&c);
(C) c=getchar();   **(D)** getchar(&c);

c. How constructor differs from destructor?

(A) Constructors can be overloaded but destructors can't be overloaded
(B) Constructors can take arguments but destructor can't
(C) There is no difference
(D) Both **(A)** and **(B)**

d. When a class uses dynamic memory, what member functions should be provided by the class?

(A) An overloaded assignment operator
(B) The copy constructor
(C) A destructor
(D) All of these options

e. In C++ operator >>is called as

   (A) An extraction operator or get from operator
   (B) An insertion operator or put to operator
   (C) An extraction operator or put to operator
   (D) None of the above

f. What is the difference between a declaration and a definition of a variable?

   (A) Both can occur multiple times but declaration must occur first
   (B) A definition occurs once, but a declaration may occur many times
   (C) A declaration occurs once, but a definition may occur many times
   (D) Both can occur multiple times but definition must occur first

g. #define MAX_NUM 15
   Referring to the sample above, what is MAX_NUM?

   (A) MAX_NUM is an integer variable
   (B) MAX_NUM is a precompiler constant
   (C) MAX_NUM is a preprocessor macro
   (D) MAX_NUM is an integer constant

h. If this is the only code in the source code file, what would be the output for the
   following program?

```
int main()
{
cout << "RAR" << endl;
return 0;
}
```

   (A) Execution time error   **(B)** Syntax error
   (C) RAR   **(D)** None

i. An exception is caused by

   (A) a hardware problem   **(B)** a problem in the operating system
   (C) a syntax error   **(D)** a run time error

j. Which one of the following variable names is NOT valid?

   (A) go_cart   **(B)** go4it
   (C) 4season   **(D)** _what

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

Q.2 a. Distinguish between Procedure-oriented programming and Object-oriented
            Programming.   **(8)**

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b. List at least four new operators added by C++ which aid OOP. **(4)**

c. Write a C++ program that will ask for a temperature in Fahrenheit and display it in Celsius. **(4)**

Q.3 a. Write a program that reads two 3x3 matrices and adds them. The program should also display the result as a 3×3 matrix. **(8)**

b. Write a program that reads the student name and marks in three subjects and displays the total marks and percentage obtained by the student. The program should declare the student as a structure and read and write the elements accordingly. **(8)**

Q.4 a. Declare a class to represent bank account of customers with the following data members: name of the depositor, account number, type of accounts(s for savings and c for current), balance amount. **(4)**

b. The class also contains member functions to do the following:
   (i)   To initialize the data member
   (ii)   To deposit money
   (iii)   To withdraw money after checking balance (minimum balance is Rs. 1000/-)
   (iv)   To display the data members. **(4)**

c. Write a program that implements the above specifications. **(8)**

Q.5 a. Write a program to overload the unary minus operator using friend function.**(8)**

b. When do we need constructors? What is a parameterized constructor? What are the advantages of using default arguments in constructors? **(8)**

Q.6 a. Write short notes on the following with example or diagram.
   (i)   Single Inheritance
   (ii)   Multilevel Inheritance
   (iii)   Multiple Inheritances
   (iv)   Hierarchical Inheritance **(8)**

b. Is it possible that a function is friend of two different classes? If yes, then how it is implemented in C++? **(8)**

Q.7 a. Write short notes on the following with example.
   (i)   Virtual Functions
   (ii)   Pure Virtual Functions
   (iii)   Abstract Class **(8)**

b. Differentiate between Early binding and Late binding. **(4)**

c. What are the various keywords on which exception handling is built? Explain each one of them. Give an example. **(4)**

Q.8 a. Write a template function to sort an array of elements. **(6)**

b. Differentiate between overloaded functions and function templates with example. **(6)**

c. When should you use template and when should you use Inheritance? **(4)**

Q.9 a. Define the class **Student** which has name (char name[20]) and age(int). Define the default constructor, member functions **get_data()** for taking the name and age of the Student, **print()** for displaying the data of Student. **(5)**

b. For the above defined class create an array of students of size N and write the friend function sort(Student arr[N]) which sorts the array of Students according to their age. **(6)**

c. Create a file "STUDENT.DAT" for storing the above objects in sorted order. **(5)**