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M.C.A. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2008.

Second Semester

DMC 1652 — OBJECT ORIENTED PROGRAMMING

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define (a) Encapsulation (b) Abstraction.

2. Differentiate object oriented and object based programming languages.

3. Which of the following can be modelled as a class?

   (a) Phone

   (b) Nokia phone

   (c) Nokia Phone 6100

   (d) Color

   (e) Green.

4. What is a dangling pointer?

5. Comment on the following overloaded function :

```
void inc (int i) {
    i = i + 1; }
Void inc (int i, int diff = 1) {
    i = i + diff; }
```

6. How do you differentiate overloaded and overridden functions?

7. Name the special functions a C++ compiler can create implicitly.

8. What are the two ways to achieve automatic type conversion from type X to type Y?

9. Differentiate (a) Template class and (b) Class Template.

10. How can you count the number of objects of a class that are created?

PART B — (5 × 16 = 80 marks)

11. (a) Describe the following programming paradigms :

(i) Imperative

(ii) Functional

(iii) Logical and

(iv) Object oriented

Give example of languages that fit these paradigms. (16)

Or

(b) (i) What type of abstraction is employed in procedure and object oriented languages? (4)

(ii) Explain the following characteristics of object oriented programming with examples : (12)

(1) Polymorphism

(2) Modurality

(3) Inheritence.

12. (a) Explain how is dynamic memory management performed in C++? What are its benefits? How does it interact with arrays, constructors and destructors overloading? Give examples to support your answer. In case of limitations, if any, provide solutions to overcome them.

Or

(b) (i) What are friend functions? What are their advantages and limitations? Give an example. (8)

(ii) Write a class to represent a bank account. Include members to represent the essential features of the account. Equip the class functions of (1) deposit (2) withdrawal (3) display balance in the account. Write a test program to validate the correctness of the functions. (8)

13. (a) Create a vector class vector containing integers. The size of the vector is to be given by an argument to the constructor. Implement the assignment operator and copy constructor. Have your vector overload the Index operator [ ] to access the individual elements. Write a program to text your vector class. Consider what will happen when the vector is expected to make a copy of itself like vector v; $v = v$; (16)

Or

(b) (i) What are default arguments? Give an example to illustrate programming syntax. (8)

(ii) Write a C++ program to print the following triangle of numbers. Keep your program as short as possible. Read n as input. (8)

```
1
2 2
3 3 3
4 4 4 4
```

14. (a) What are virtual functions? Explain their need using a suitable example. What are the rules associated with virtual function? (16)

Or

(b) Give the syntax of function template. Write template function for sorting. Write a test program to illustrate its use. (16)

15. (a) Take a sample application as a case study and explain the following :

(i) Types of classes and their roles

(ii) Need for abstract classes

(iii) Interfaces required

(iv) Hierarchy implementation.

Or

(b) Explain the different types of dasses with suitable illustrations.
