SE22

Roll No: 16MCA08

MCA (Sem-II) Examinations – 2016-17
Object-Oriented Programming in C++ (Theory)

Time: 2 Hours

Max Marks: 75

- **Write your Roll no. on the top immediately on receipt of the question paper.**
- **Attempt ALL questions by selecting any TWO parts. All Question carry equal marks.**

1. (a) Distinguish between Procedure-Oriented and Object-Oriented paradigms with suitable examples. What are the Pros and Cons of Object-Oriented Methodology? Explain.

   (b) Describe the different derived data types available in C++. Explain the explicit & implicit type conversions with suitable examples.

   (c) What are input and output streams? Explain various streams available in C++ with suitable examples.

2. (a) What is a friend function? What are the merits and demerits of a friend function? How does friend function act as a bridge between two classes? Explain with a suitable example.

   (b) Explain the differences between passing arguments "by reference" and "by addresses" to functions. Explain the use of *this* pointer through an example.

   (c) Define a class *Student* which has *rollno* and *name* as data members. Define the constructor, the destructor and a function print() which prints the details of a student. Create an object of type *Student* in main() and print it.

3. (a) What is operator overloading? Write the rules used for overloading operators. List out the operators that cannot be overloaded using a member function. Write a program to concatenate (join) two objects of class *String* by overloading '+' operator.

   (b) What do you mean by overloading of a function? On what basis, the compiler distinguishes between a set of overloaded functions having the same name. Write a program to compute the area of a triangle and circle by overloading the area function.

   (c) Explain how the static data members and static member functions are declared and used in C++.

4. (a) Explain the usage of public, private and protected access modifiers for members in inheritance through suitable examples. What is Inheritance? Explain different types of Inheritance with suitable examples. What problem may be encountered in Multiple Inheritance and how is it solved? Explain.

   (b) What is virtual function? What is the difference between static binding and run-time binding? Explain with a suitable C++ code.

   (c) What do you mean by Abstract class and pure virtual functions? What is the use of an Abstract class? Explain the difference between function overloading and function over-riding with the help of suitable examples.

5. (a) Explain any three classes used for the file stream operations with examples. Write a program in C++ to open a file *"Hello.dat"* and write a text to the file. Read the file and display its content.

   (b) What do you mean by Exceptions? What mechanism is used for handling exceptions in C++? Write a program to explain the usage of *try* and *catch* blocks.

   (c) What do you mean by generic function and generic class? What are its benefits? Write a generic class and generic member function to find the sum of two complex numbers with real and image data members of any numeric types.

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Object Oriented Programming

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ALL questions. Choices are given in each question set.

2x7=14

tempt any TWO of the following:

(a) What are structured and unstructured programming? Explain with the help of suitable examples.

(b) Define class, object and ADT and give their examples.

(c) Explain concept and advantages of Polymorphism and Inheritance.

2x7=14

2. Attempt any TWO of the following:

(a) What are constructor and destructor? Explain with the help of suitable examples.

(b) Write a friend function that takes one data member from one class as an argument and other argument will be data member from other class and displays their sum.

(c) Write a program in C++ to demonstrate passing objects to a function and returning objects from a function.

3. **Attempt any TWO of the following:** **2x7=14**

(a) Explain with the help of suitable program segments the concept of pointers and references. Also, explain what is ***this*** pointer?

(b) How to allocate array dynamically? Explain. Also, explain use of **new** and **delete** operators with the help of suitable program segments.

(c) Give examples (program) of reference parameter and pointer parameter to a function and calling mechanism.

4. ***Attempt any TWO of the following:*** **2x7=14**

(a) Write a program to demonstrate binary operator * overloading with the help of multiplication of two matrices of order 3 X 3.

(b) Define function overloading. What are the various criteria for function overloading?

(c) What is copy constructor? Give an example. How to overload constructors?

Dynamic Binding / function

1x10=10

5. **Attempt any ONE of the following:**

(a) Write a program in C++ to demonstrate polymorphism? Also, explain the concept of late and early bindings.

(b) Explain the different type of inheritances. Write a program to implement multiple inheritances.

Static Binding

1x9=9

6. **Attempt any ONE of the following:**

(a) What is exception handling? Explain. Write a program to implement the concept of exception handling.

(b) Using file handling feature of C++, read the contents of a given test file and display the same contents to the screen, also write them to a new file.