

Department of Computer Science and Engineering
Motilal Nehru National Institute of Technology
Allahabad, Uttar Pradesh, India

Object Oriented Modeling (CS1504) + Object Based Modeling (CA3305)
B. Tech. (V Semester(CS+IT) and MCA-III Semester.

Mid Semester Exam **Max Marks: 20** **Max Time: One and Half Hour**

- If you need to make any assumptions, state them clearly.
- Questions carry marks shown against them.

Q1. Considering an example of an ATM, describe the basic principles of object orientation (Abstraction, Encapsulation, Data Hiding, Implementation Hiding, Polymorphism, Inheritance, Composition) conceptually i.e. where one can see/perceive these principles in physical machine (ATM) and then describe with an example code in Java/C++ how one can realize it in an application program that supports the functionalities of ATM. Explain also with an example code how multiple interfaces with single implementation can support safe transactions and maintenance of ATM efficiently along with better refinability of the ATM implementation. [10]

Q2. (A) List the members of a class. [01]

(B) You have written a class in Java to print your name. If you instantiate an object of the above class, the object instantiated by you will be polymorphic or not. Explain your answer. [01]

(C) Illustrate through an example code how polymorphism helps to substitute the use of "switch" and "case" statements. List the advantages of the above. [01]

(D) Describe various types of data members and method members of a class along with the accessibility of one member from the other. [01]

(E) Why concept of "this pointer" or "self reference" has been introduced into OOPs. What are the various uses of this pointer? [01]

Q3. Consider a method being used in an application class as `Serve(Serviceable x)`. We have an interface `Serviceable` which has methods `f()` and `g()`. A totally unrelated class `X` has methods `m()` and `n()` already implemented which has behavior of `f()` and `g()`. Design all solutions which make use of `m()` and `n()` methods for `Serviceable` and let method call `Serve(x)` working without any error in application class. [05]