4. (a) Differentiate between abstract class and interface. Write a java program to implement multiple inheritance. (CO2)

OR

(b) Explain the package in Java. How can we create user define package ? Differentiate between import and static import with a suitable java program. (CO2)

5. (a) Explain the various Wrapper classes and also explain boxing, boxing concept.

(CO1)

OR

(b) Define a class Foundation inside the test package. Inside the class declare 4 integer variables with private, <default>, protected and public access modifier. Import the class and package in another class named as "Base". Try to access all four variables. (CO2)

H Roll No. ....

TMC–202

M. C. A. (SECOND SEMESTER)

MID SEMESTER

EXAMINATION, April, 2023

OBJECT ORIENTED ANALYSIS USING

JAVA PROGRAMMING

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Attempt all questions choosing any *one* of the sub-questions.

(ii) Each sub-questions carries 10 marks.

1. (a) Explain Java Virtual Machine and its components with a neat and clean diagram. (CO1)

P. T. O.

OR

(b) Explain compile time polymorphism and also explain method overloading. Akshay wants to calculate the area of 3 different shapes–Square, rectangle triangle and circle. Create three different methods having the same name calculate Area(parameters) to calculate the area of these shapes. Take Input from using Scanner class (height, width, radius).

2. (a) Explain the use of a constructor. Differentiate between default and parameterized constructors using the java program. Is it possible to define a constructor in an abstract class and explain the reason. (CO2)

OR

(b) Differentiate between mutable and immutable strings with examples. Differentiate equals() method for String class objects and StringBuffer objects using java code and also compare equals() and (equal to)==. Operator. (CO2)

3. (a) Explain the jagged array. Write a java program to create a jagged array of integer elements. Using the Scanner class, ask a user to enter elements in a jagged array and display the elements of the same array also calculate the sum of even elements present in the jagged array. (CO1)

OR

(b) Explain inheritance and its types. Create a class Person with a member variable name. Save it in a file called Person.java. Create a class called Employee that will inherit the Person class. The other data members of the Employee class are annual salary (double), the year the employee started to work, and the national insurance number. Your class should have the necessary constructors and getter/setter methods. Create another class called Test Employee containing a main method to fully test your class definition. (CO2)