**Meerut Institute of Technology, Meerut**

***Department of Computer Science and Engineering***

**Course: *Object Oriented Programming with Java (BCS-403)***

**Assignment -1**

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***Question 1:***

Write a Java program to create a class named Book with data members: title, author, and price. Include a parameterized constructor to initialize the data. Add a method to display the details of the book. Create at least two Book objects and display their details.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K3

***Question 2:***

Write a Java program to input 5 integers from the user into an array, and then calculate and display the sum and average of the numbers. Also, print whether each number is even or odd.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K3 – Application

***Question 3:***

Write a Java program to demonstrate single inheritance. Create a superclass Employee with data members name and salary, and a method display(). Create a subclass Manager with an additional field department and override the display() method to include the department information.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K4 – Analysis

***Question 4:***

Create a class Calculator that implements method overloading for:

Addition of two integers

Addition of three integers

Addition of two double values

Write a main() method to demonstrate these methods.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K3 – Application

***Question 5:***

Create a class Student with data members rollNo, name, and instituteName. Make instituteName a static variable and assign a default value to it. Add a static method to change the college name. Create objects for 3 students, display their details, then change the college name using the static method and display again. Also, demonstrate the use of string methods on the student’s name.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K3 – Application

***Question 6:***

Create an abstract class Shape with an abstract method area(). Implement two subclasses Circle and Rectangle that override the area() method. Also, create an interface Printable with a method printDetails() and implement it in both classes. Demonstrate dynamic method dispatch using a Shape reference.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K4 – Analysis

***Question 7:***

Create a user-defined package named myutils. In this package, create a class MathUtil that contains a method factorial(int n) which returns the factorial of a number. In another class (in a different package), import the package and use the factorial method. Also, demonstrate how to set the CLASSPATH and compile/run the program.

***Course Outcome (CO):*** CO1 – Develop the object-oriented programming concepts using Java  
***Bloom’s Knowledge Level (KL):*** K3 – Application