

University of Information Technology & Sciences (UITS)
Faculty of Science and Engineering
Department of Computer Science and Engineering
Program: B.Sc. in CSE
Mid Term Examination, Spring 2025
Course Title: Object Oriented Programming Language
Course Code: CSE0613121/CSE203/CSE151

Marks: 20

Time: 1(one) hour

(Answer all questions)

- | | Marks |
|---|-------|
| 1. a) Explain how the core principles of Object-Oriented Programming (OOP) improve code organization, reusability, and maintainability. write the mechanism behind Java's platform independence and the role of the Java Virtual Machine (JVM) in achieving it. | [2+3] |
| b) Define the instanceof operator in Java with its syntax and an example. | [02] |
| c) Solve the output from the below code snippet: | [03] |

```
public class Main {  
    public static void main(String[] args) {  
        int number = 10;  
        number++;  
        System.out.println("After increment: " + number);  
        number--;  
        System.out.println("After decrement: " + number);  
        String result = (number % 2 == 0) ? "Even" : "Odd";  
        System.out.println("The number is: " + result);  
    }  
}
```

2. a) The Teacher class contains three attributes: name (a String representing the teacher's name), subject (a String representing the subject taught), and salary (a double representing the teacher's salary). ~~06~~
09

The method displayTeacherInfo (name, subject, and salary) is responsible for printing the teacher's details (name, subject, and salary). Construct a java program to print the three teacher information from the main method.

*salary
string and
name*

b) Create a Java class named Book that implements constructor overloading to initialize book objects in different ways. [04]
06

a. Attributes:

- title (String): Represents the title of the book.
- author (String): Represents the author of the book.
- price (double): Represents the price of the book.

b. Constructors (Constructor Overloading):

- Constructor 1: Book(String title, String author, double price) – Initializes all attributes.
- Constructor 2: Book(String title, String author) – Initializes title and author, sets default price to 0.0.
- Constructor 3: Book(String title) – Initializes only title, sets default author as "Unknown" and price as 0.0.

c. Methods:

- displayDetails(): Prints the book's title, author, and price.
- applyDiscount(double discountPercentage): Reduces the price of the book by the given discount percentage.

```
discountAmount = price * (discountPercentage / 100);
```

```
price = price - discountAmount;
```

d. Main Method:

- Create three book objects using different constructors:
 1. With title, author, and price: "Java Programming", "John Doe", 500.0.
 2. With title and author: "Python Basics", "Alice Smith".
 3. With only the title: "C++ for Beginners".
- Apply a 15% discount to the first book's price.
- Display the details of all books using the displayDetails() method.