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, Autumn 2024

Course Title: Object Oriented Programming Language

Course Code: CSE 0613121

Marks: 20 **Time: 1 hour**

(Answer all questions)

Marks

1. a) Compare between Procedural Programming and Object-Oriented Programming. **[03]**

b) "Java is a platform independent language but JVM is platform dependent" - explain the statement. **[03]**

c) Develop a Java program using switch case that helps a grocery store to calculate discounts for customers based on their membership levels. The store has the following membership levels and corresponding discounts: **[04]**

- **Gold**: 20% discount
- **Silver**: 15% discount
- **Bronze**: 10% discount
- **Non-member**: No discount

Write a program that:

1. Uses a switch-case statement to determine and print the corresponding discount.
2. Prints a message for invalid membership levels.

2. a) Suppose you want to calculate the volume of a box. Now, **construct** a Java program which will contain two classes: Box and BoxDemo2 with the following features: **[05]**

i) Class Box:

- It defines three instance variables: width, height, and depth, all of type double.

ii) Class BoxDemo2:

- This class contains the main method where the program execution starts.

- Create Box objects (mybox1 and mybox2).
- For each box, assignee value to its width, height, and depth.
- The volume of each box will be computed by multiplying width, height, and depth, and the result will be printed to the console.

b) You are developing a class `Book` for a library management system. The library needs flexibility in creating book objects based on the available information. A book can be added to the system with just the title, or it can include additional details such as the author and publication year. To accommodate this, you decide to apply constructor overloading in the `Book` class. Construct `Book` class that utilizes constructor overloading to support the following scenarios: **[05]**

- Create a `Book` object using only the title.
- Create a `Book` object using the title and author.
- Create a `Book` object using the title, author, and publication year.

Now write a java program to implement the above scenarios in `TestClass` which will contain the main method and show the output like that:

Book1 Information: Java Basics

Book2 Information: Advanced Java, John Doe

Book3 Information: Data Structures, Jane Smith, 2020