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 2025
Course Title: Object Oriented Programming Language
Course Code: CSE 0613121

Marks: 20   **Time: 1 (one) hr.**

(Answer all questions sequentially)

			Marks
1.	a)	Java is considered a portable programming language, and its bytecode plays a crucial role in making it platform-independent. **Explain** how Java achieves portability and platform independence through bytecode and the Java Virtual Machine (JVM)	[03]
	b)	Differentiate between a parameterized constructor and a method in terms of: Purpose and functionality, Return type, Reusability, Role in object initialization.	[03]
	c)	A power supply company charges customer based on their usage:	[04]

- Domestic: 5 taka per unit
- Commercial: 8 taka per unit
- Industrial: 10 taka per unit
- Others: Invalid category

Write a Java program using **switch-case** that takes customer type and number of units as input, calculates the bill, and prints the total amount.

2.	a)	Develop a Java program with the following specifications:	[04]

- Create a class named `Number`.
- Include a **parameterized constructor** in the class that takes an integer as an argument and initializes the instance variable `num`.
- Define a method `square()` inside the class that calculates and returns the square of the number stored in the object.
- In the `main()` method:
  - Create an object of the class `Number` using the parameterized constructor.
  - Call the `square()` method and display the result in a descriptive format.

b) Suppose, you have joined as a software developer in a university automation project. As part of this project, you are assigned to **design** a Student class. Follow the instructions below: Design a class **Student** which contain: [06]

- int id
- String name
- double gpa
- Parameterized constructor → to initialize id, name, and gpa.
- Copy constructor → creates a new Student object by copying another Student object.
    - **Condition:** If the GPA of the original student is less than 2.0, then the new student's GPA must be set to **2.0 (minimum GPA allowed).**
- display () → void → prints student details in the following format:

    Student ID: 101
    Student Name: Rahim
    Student GPA: 3.5

Instructions:

- Create an object s1 using the parameterized constructor with values (101, "Rahim", 3.5).
- Create another object s2 using the copy constructor, passing s1 as argument.
- Print details of both students using display ().
- Now create another object s3 with GPA = 1.5, and again create a copy s4 using the copy constructor. Show that the GPA of s4 is automatically set to 2.0 due to the condition.