Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (R) (FT/WP) Examination November 2025 (2024 Scheme)

Course Code: PBCST304

Course Name: OBJECT ORIENTED PROGRAMMING

Max. Marks: 40 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 2 marks)

		CO	Marks
1	What is the role of the Just-In-Time (JIT) compiler in the Java Virtual Machine (JVM)? Explain how it improves the performance of Java programs during execution.	CO1	(2)

2	What is the output of this code snippet and the value for n after the execution of this code?
	`int n = 29; // binary 11101`
	`System.out.println(n >> 1);`
	`System.out.println(n >>> 1);`
	`System.out.println(~n);`
		CO1	(2)

3	What is the output of the program, justify your answer.
	`// Base class (Parent)`
	`class Animal {`
	`  Animal() {`
	`  System.out.println("Animal constructor called");`
	`  }`
	`  void sound() {`
	`  System.out.println("Animals make sounds");`
	`  }`
	`}`
	
	`// Derived class (Child)`
	`class Dog extends Animal {`
	`  Dog() {`
	`  super()`
	`  System.out.println("Dog constructor called");`
	`  }`
	`void sound() {`
	`  System.out.println("Dog barks");`
	`  }`
	`}`
		CO2	(2)

```
// Main class
public class InheritanceDemo {
   public static void main(String[] args) {
      Dog d = new Dog();  // Object of subclass
      d.sound();          // Calls overridden method
   }
}
```

4		Explain the use of the ***final*** keyword in Java.	CO2	(2)
5		What is a package in Java? Explain its advantages and types with suitable examples.	CO3	(2)
6		Differentiate interfaces and abstract classes with examples	CO4	(2)
7		How would you design a user registration GUI application that saves data to a database? Provide the Model-View-Controller (MVC) diagram representing this design.	CO5	(2)
8		Compare Java AWT and Swing.	CO5	(2)

PART B

(Answer any one full question from each module, each question carries 6 marks)

Module -1

9	a)	Write a Java program to create an **array of Student objects**. Each student has the following attributes: **Name** (String) **RegNo** (String) **Marks** of 3 subjects(double) The class should include: 1. A **parameterized constructor** to initialize all attributes. 2. A **default constructor** that assigns default values. 3. A method `display()` to print the details of each student. In the `main()` method, Create an array of 3 `Student` objects. Use both the **default** and **parameterized** constructors to initialize the objects. Display the details of all students.	CO2	(4)
	b)	Explain encapsulation and polymorphism with examples.	CO1	2
10	a)	Explain Arithmetic and Bitwise operators of Java with sufficient examples	CO1	4
	b)	Explain the access specifiers of Java. How access specifiers help in achieving data hiding in Java?	CO2	2

Module -2

11		Write a Java program to demonstrate inheritance with the use of constructors. The program should have the following class structure:	CO2	6

Class 1: Bank (Superclass)
Attributes:
- bankName (String)
- branch (String)

Constructor:
- Parameterized constructor to initialize the above attributes.

Method:
- displayBankDetails() — displays bank name and branch.

Class 2: SBAccount (Subclass of Bank)
Attributes:
- accountHolder (String)
- balance (double)

Constructor:
- Parameterized constructor to initialize all attributes (including superclass attributes using super()).

Method:
- displaySBDetails() — displays complete Savings Account details.

Class 3: CurrentAccount (Subclass of Bank)
Attributes:
- accountHolder (String)
- balance (double)

Constructor:
- Parameterized constructor to initialize all attributes (including superclass attributes using super()).

Method:
- displayCurrentDetails() — displays complete Current Account details.

Main Class: BankDemo
In the main() method:
- Create objects for both SBAccount and CurrentAccount.
- Display their details.

12	a)	Write a Java program to demonstrate Runtime Polymorphism using method overriding.	CO2	4
	b)	What is the use of keyword ***Super***. Give example.	CO2	2

Module -3

13		Write a Java program to create a package named `College` that contains a `Student` class with the following specifications: The `Student` class should have: •Attributes: name (String), rollNumber (String), grade (char) •A parameterized constructor to initialize all attributes •A method `displayInfo()`that displays all student details •A method `calculateGradePoint()` that returns grade points (A=10, B=8, C=6, D=4, F=0)	CO3	6

Create a `Myclass` class in the default package that:
1.Imports the `College` package
2.Creates 2 Student objects
3.Displays their information and grade points
Show the complete directory structure, compilation, and execution steps.

14	a)	Differentiate between **checked** and **unchecked** exceptions in Java. Give suitable examples for each type.	CO3	2
	b)	What is exception handling in Java? Explain the following keywords with suitable examples: (i)try and catch (ii)throw (iii)throws (iv)finally	CO4	4

Module -4

15	a)	Write a Java program using **Swing components** to create a simple **"Login" window**. The application should have the following: • Two labels: **User ID** and **Password** • Two text fields to input User ID and Password • One button labeled **Submit** • One label named **Status** (initially blank) When the user clicks the **Submit** button, the status label should display **"Welcome"**.	CO5	4
	b)	Discuss any two java swing components.	CO5	2
16	a)	What are the steps to connect to a database using JDBC? Explain with an example program.	CO5	4
	b)	How does the Delegation Event Model work in Swing applications?	CO5	2

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