

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

B.Tech-III Semester (CSE/IT/BT/ECE/CE)

COURSE CODE (CREDITS): 18B11CI311

MAX MARKS: 35

COURSE NAME: OBJECT ORIENTED SYSTEMS AND PROGRAMMING

COURSE INSTRUCTOR: Dr. Ruchi Verma

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is not allowed

Q.No	Question	CO	Marks
Q1	Assessment-Based Questions 5*1 marks=5 marks a. Differentiate between hierarchical inheritance and multiple inheritance using interfaces in Java. b. Why can an abstract class not be instantiated directly? c. What are the advantages of declaring a method as final in Java? d. Differentiate between software testing and software debugging. e. Which UML diagrams are mainly used to model dynamic behavior in a system? Name any two.	CO2	5
Q2	2* 5 marks=10 marks a. Explain multilevel inheritance in Java with a suitable program example. b. Compare interfaces and abstract classes in Java with appropriate examples. c. Explain abstract methods, final methods, and final classes. How are they useful in software design? d. Discuss the fundamental principles of Software Engineering and their importance in software development. e. Explain the major phases involved in System Analysis and System Design.	CO3,CO1	10
Q3	5*2= 10marks a. Design a UML Class Diagram for a Library Management System showing classes, attributes, and relationships. b. Write a Java program to demonstrate the implementation of interfaces along with inheritance and abstract classes. Explain the execution flow of the program.	CO2	10

Q4	Write a Java program to create an abstract class Shape with an abstract method area(). Derive two classes Circle and Rectangle from it and calculate the area of both shapes using runtime polymorphism.	CO4	3
Q5	Write a Java program to define an interface Payable containing a method calculatePayment(). Implement this interface in classes Employee and Freelancer and display the payment details for both.	CO6	3
Q6	Write a Java program to demonstrate multilevel inheritance using classes Person, Student, and Result. Display the personal details, academic details, and final result of a student.	CO5	4