

**DEPARTMENT: COMPUTER SCIENCE/AI**

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| *Internal Assessment* | **I** | *Academic Year/Semester* | **2023-24 /III** |
| *Subject* | CST-205 Object Oriented Programming Using Java | *Branch* | CSE/AI |
| *Date of Exam* | 25/10/2023 | *Duration* | **120 Min** |
| *Starting time* | 9:30 to 11:30 AM | *Max. Marks* | **60** |

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| **PART-A (*Answer all questions, each carries 3 marks*) Max Marks: 12** | | | | |
| ***Q.No*** |  | ***Marks*** | ***CO*** | ***Level*** |
| **1** | How Platform Independence achieved in Java | 3 | I | L1 |
| **2** | Explain Garbage Collection Done in Java | 3 | II | L1 |
| **3** | Discuss the concept of classes and objects in Java language using an example of a 'student' object in a Student management application. | 3 | II | L2 |
| **4** | What are the advantages of using UML? Sketch the UML class diagram for an entity Employee. | 3 | I | L1 |

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| **PART-B (*Each question carries 12 marks)* Max Marks: 48** | | | | | | | |
| **5** | |  | | A soft drink vending machine accepts coins for a variety of products. When the amount of money deposited into the machine is equal to or greater than the price of any of its available products, the respective product selection buttons will be enabled for the user to make the selection. After the user has made a valid selection, the machine will dispense the soft drink, together with the change (if applicable). Draw a Class Diagram. | 12 | I | L3 |
| **OR** | | | | | | | |
| **6** | |  | | Construct a UML Class diagram for Online Movie Ticket Booking System. The various entities involved in the system are Admin, Registered User, Guest User, Movie, Book Ticket, and Make Payment. | 12 | I | L3 |
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| **7** | | a | | Bring out the difference between function oriented software design approaches and object oriented software design approach using the example of an automated fire alarm system. | 6 | I | L2 |
| b | | Write a Java program to calculate the area of different shapes namely circle, rectangle, and triangle using the concept of method overloading. | 6 | II | L3 |
| **OR** | | | | | | | |
| **8** | | a | | Why is the 'main' method in Java qualified as public, static, and void? | 4 | II | L2 |
| b | | Write a java program to show the significance of method overriding achieving run time polymorphism. Discuss difference between method overriding and method overloading' | 8 | II | L3 |
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| **9** | | a | | Write a Java program to calculate the area of different shapes namely circle, rectangle, and triangle using the concept of method overloading | 8 | II | L3 |
| b | | Differentiate Association, Aggregation, Composition and Dependency relationships. | 4 | I | L2 |
| **OR** | | | | | | | |
| **10** | **a** | | Write a Java program that accepts two three digit numbers as command line arguments and find all palindrome numbers between them. | | 8 | I | L3 |
| **b** | | Illustrate the Java Programming and Runtime Environment. Explain the roles of each component of it while compiling and executing a java program. | | 4 | I | L2 |
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| **11** | **a** | | Differentiate Default Constructor, and Parameterized Constructor?  Is it possible to create an object for class A using, A ob = new A(); if the class contains only parameterized constructor? Why? | | 6 | II | L2 |
| **b** | | Write a Java program to display the transpose of a given matrix | | 6 | I | L3 |
| **OR** | | | | | | | |
| **12** | **a** | | Differentiate Type Conversion and Casting? | | 4 | I | L3 |
| **b** | | Write a Java class in such a manner that it is restricted to have only one instance throughout the program in which it is used | | 8 | II | L2 |

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| **Course Outcomes (CO):** |
| **CO I :** Write Java programs using the object oriented concepts - classes, objects, constructors, data hiding, inheritance and polymorphism |
| **CO II :** Utilize data types, operators, control statements, built in packages & interfaces, Input/ Output Streams and Files in Java to develop programs |
| **Bloom’s Taxonomy Level:** |
| L1: Remember, L2: Understand, L3:Apply L4:Analyze |