**OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB**

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| **Course Code:** | 23CS3352 | **Year:** | II | **Semester:** | I |
| **Course Category:** | PC | **Branch:** | CSE | **Course Type:** | PRACTICAL |
| **Credits:** | 1.5 | **L – T – P** | 0-0-3 | **Prerequisites:** | C Programming language |
| **Continuous Evaluation:** | 30 | **Semester End Evaluation:** | 70 | **Total Marks:** | 100 |

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| **Course Outcomes** |
| Upon successful completion of the course, the student will be able to: |
| **CO1** | Apply the concepts of object-oriented programming and Java programming constructs to develop applications. | L3 |
| **CO2** | Implement programs as an individual on different IDEs/ online platforms | L3 |
| **CO3** | Develop an effective report based on various programs implemented. | L3 |
| **CO4** | Apply technical knowledge for a given problem and express with an effective oral communication. | L3 |
| **CO5** | Analyse outputs using given constraints/test cases. | L4 |

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| **Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3: Substantial, 2: Moderate, 1: Slight)** |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  |  |  |  |  |  |  |  |  |
| **CO2** |  |  |  |  | 2 |  |  |  | 2 |  |  |  |
| **CO3** |  |  |  |  |  |  |  |  |  | 1 |  |  |
| **CO4** | 2 |  |  |  |  |  |  |  |  | 2 |  |  |
| **CO5** |  | 2 |  |  |  |  |  |  |  |  |  |  |
| **Avg.** | **2** | **2** |  |  | **2** |  |  |  | **2** | **1.5** |  |  |

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| **Syllabus** |
| **S No.** | **CONTENTS** | **Mapped****CO** |
|  **1** | **Exercise – 1**:a) Write a JAVA program to display default value of all primitive data type of JAVAb) Write a JAVA program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root.  | **CO1, CO2,****CO3, CO4, CO5** |
| **2** | **Exercise - 2**a) Write a JAVA program to search for an element in a given list of elements using binary search mechanism.b) Write a JAVA program to sort for an element in a given list of elements using bubble sortc) Write a JAVA program using StringBuffer to delete, remove character. | **CO1, CO2,****CO3, CO4, CO5** |
| **3** | **Exercise - 3**a) Write a JAVA program to implement class mechanism. Create a class, methods and invoke them inside main method.b) Write a JAVA program implement method overloading.c) Write a JAVA program to implement constructor.d) Write a JAVA program to implement constructor overloading. | **CO1, CO2,****CO3, CO4, CO5** |
| **4** | **Exercise - 4**a) Write a JAVA program to implement Single Inheritance b) Write a JAVA program to implement multi level Inheritance c) Write a JAVA program for abstract class to find areas of different shapes | **CO1, CO2,****CO3, CO4, CO5** |
| **5** | **Exercise - 5**a) Write a JAVA program give example for “super” keyword.b) Write a JAVA program to implement Interface. What kind of  Inheritance can be achieved?c) Write a JAVA program that implements Runtime  polymorphism  | **CO1, CO2,****CO3, CO4, CO5** |
| **6** | **Exercise – 6**a) Write a JAVA program that describes exception handling  mechanism b) Write a JAVA program Illustrating Multiple catch clauses 1. Write a JAVA program for creation of JAVA Built-in Exceptions
2. Write a JAVA program for creation of User Defined Exception
 | **CO1, CO2,****CO3, CO4, CO5** |
| **7** | **Exercise – 7**1. Write a JAVA program that import and use the user defined packages.

b) Write a JAVA program that import and use the user defined  packages with jar fileC) Write a Java Program to explore the following classes  i) Formatter class ii) Random Class  iii) Formatting for Date/Time in Java  | **CO1, CO2,****CO3, CO4, CO5** |
| **8** | **Exercise – 8** a) Write a JAVA program that creates threads by extending Thread class. First thread display “Good Morning “every 1 sec, the second thread displays “Hello “every 2 seconds and the third display “Welcome” every 3 seconds,(Repeat the same by implementing Runnable) illustrating b) Write a program **is Alive** and **join ()**c) Write a Program illustrating Daemon Threads.  | **CO1, CO2,****CO3, CO4, CO5** |
| **9** | **Exercise – 9**1. Implement the programs using ArrayList class
2. Implement the programs using HashSet class
3. Implement the programs using PriorityQueue class
 | **CO1, CO2,****CO3, CO4, CO5** |

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| **Learning Resources** |
| **Text Books** |
| 1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
2. Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023.
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| **Reference Books** |
| 1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson
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| **E-Resources & other digital material** |
| 1. <https://nptel.ac.in/courses/106/105/106105191/>
2. <https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview>
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