

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN  
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)  
Chromepet, Chennai - 600 044.

B.Sc.AI - END SEMESTER EXAMINATIONS - NOV'2024  
SEMESTER - III

**22UAICT3003 - Java and Data Structures**

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

**Section B**

Answer any **SIX** questions ( $6 \times 5 = 30$  Marks)

1. Describe the main features of Java that distinguish it from other programming languages.
2. Create a Java program that handles exceptions using the try-catch block.
3. Analyze the differences between array-based implementation and linked list-based implementation of the List ADT.
4. Write a program to create a binary search tree and perform basic operations like insertion, search, and deletion.
5. What is the purpose of a constructor and how the constructors differ from regular methods.
6. Analyze how access protection works in Java by writing a program that uses different access specifiers of private, protected, default, public.
7. Write a program that performs push, pop, and peek operations in stack
8. Compare depth-first search and breadth-first search algorithms in terms of their space and time complexity.

**Section C**

Answer any **THREE** questions ( $3 \times 10 = 30$  Marks)

9. Create a Java program that illustrates the usage of different control statements of if-else, switch, for, while, do-while.
10. Design a Java program that implements method overloading and method overriding and compare the two concepts .
11. Evaluate the role of applets in Java programming and discuss how applet technology compares to modern GUI-based frameworks.
12. Write a program that demonstrates the use of a queue for this application and explain how the First In First Out principle helps manage tasks efficiently.
13. Evaluate different tree traversal techniques of in-order, pre-order, post-order, and level-order by writing code to implement each traversal on a binary tree.

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