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.DS - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - II
22UDSCT2002 - 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. What are control statements in Java? Discuss the differences between if-else and switch statements with examples.
2. Explain the concept of method overriding in Java. How does it differ from method overloading? Provide examples to illustrate your answer.
3. Define string class and illustrate types with examples.
4. Describe exception handling in Java. What are the key components (try, catch, finally) involved, and how do they help manage errors?
5. Define Abstract Data Types (ADTs) and explain the singly linked list ADT. Discuss its operations and applications.
6. What is the Queue ADT? Explain its operations and provide an example of how it can be implemented in Java.
7. Explain the concept of binary trees. Describe the different types of binary tree and provide examples of each.
8. What are binary search trees (BSTs)? Discuss their properties and advantages. How does the insertion operation work in a binary search tree?

Section C

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

9. Discuss the core concepts of Object-Oriented Programming (OOP). How do encapsulation, inheritance, and polymorphism contribute to software design? Provide examples in Java.
10. Define classes and objects in Java. Explain the role of constructors and how constructor overloading works. Provide code examples to illustrate your points.

Contd...

11. Explain interfaces in Java and their importance in achieving abstraction. Discuss how interfaces differ from classes, and provide an example of how to define and implement an interface.
12. Explain the Stack ADT and its operations. Discuss a practical application of stacks in evaluating arithmetic expressions and converting infix to postfix notation.
13. What are binary search trees (BSTs)? Discuss their properties and how they differ from regular binary trees. Explain the operations of insertion, deletion, and searching in a BST with examples.

*****