



Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)

Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

Continuous Internal Assessment Test I – February 2026
II Semester

Class : I UG
Major : Computer Science

Time: 2 hours
Maximum Marks: 60

23BCSC03 Data Structures

Course Outcomes:

At the end of the course, students will:

1. To understand the basic ideas of algorithms and data structures.
2. Apply linear and nonlinear data structures to programming solutions
3. Understand and apply tree and graph structures
4. Ability to choose and implement appropriate data structures in real-time problems.
5. Obtain knowledge of advanced data structures.

Part - A

6 x 1 = 6

Choose the Correct Answer

1. Time complexity refers to time required to execute an algorithm in terms of _____.
a. Best Case b. Average Case c. Worst Case d. Better Case CO1 K1
2. Identify among the following which is not a linear data structure.
a. Arrays b. Queue c. Linked List d. Tree CO1 K1
3. Which of the following stack operations could result in stack underflow?
a. Push() b. Pop() c. Isempty() d. Isfull() CO1 K2
4. Which data structure allows insertion and deletion at both ends?
a. Queue b. Circular Queue c. DeQueue d. Priority Queue CO2 K2
5. Infix to postfix conversion is an application of _____.
a. Queue b. Stack c. Array d. Graph CO2 K1
6. A binary tree can have a maximum of how many children per node?
a. 1 b. 2 c. 3 d. 4 CO3 K2

Part - B

3 x 6 = 18

Answer ALL Questions

Each answer should not exceed 400 words or two pages

7. a. Define an algorithm. Explain the characteristics of a good algorithm with an example. CO1 K2
(or)
7. b. Write a short on asymptotic notations to represent complexity of algorithms. CO1 K2
8. a. With a neat diagram, explain the classification of data structures. CO1 K2
(or)
8. b. Evaluate the postfix expression $A*B-(C+D)+E$ using stack. CO2 K3
9. a. Explain in brief on the different types of Queues. CO2 K2
(or)
9. b. Define a binary tree. Explain its properties and types with suitable diagram. CO3 K2

Part - C

3 x 12 = 36

Answer ALL questions

Each answer should not exceed 800 words or four pages

10. a. Explain array representation and insertion and deletion operations. CO1 K2
(or)
10. b. What is performance analysis of algorithms? Explain time and space complexity. CO1 K2
11. a. Explain the stack data structure and its operations in detail. CO2 K2
(or)
11. b. Explain how to convert an infix expression to a postfix expression using stack. CO2 K3
12. a. Write in detail on the queue operations and their algorithms, with an example. CO2 K2
(or)
12. b. Discuss the method of inserting and deleting elements in a linked list. CO2 K2