

QP CODE: D3BCS2403

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Reg. No : .....

Name : .....

**THIRD SEMESTER FYUGP EXAMINATION, NOVEMBER 2025**

**Discipline Specific Core (DSC) Courses - Major**

**CSC3CJ202: Data Structures and Algorithms**

**(Credits: 4)**

**Time: 2 Hours**

**Maximum Marks: 70**

**Section A**

**Answer the following questions. Each carries 3 marks (Ceiling: 24 marks)**

1.	List any two data structures used in non-recursive traversal algorithms.	BL1	CO3
2.	Explain the difference between insertion and deletion in arrays.	BL2	CO1, CO2
3.	Define height of a binary tree.	BL1	CO3
4.	Differentiate between push and pop operations.	BL2	CO2
5.	List any three collision resolution techniques.	BL1	CO4
6.	Explain why linked lists are called dynamic data structures.	BL2	CO2, CO5
7.	Explain why array-based representation of binary tree may waste memory.	BL2	CO3, CO5, CO6
8.	Define inorder traversal.	BL1	CO3, CO5
9.	Differentiate between selection sort and bubble sort.	BL2	CO4
10.	Explain the term "degree of a vertex" with an example.	BL2	CO3

**Section B**

**Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)**

11.	Define queue and describe its array representation with diagram.	BL2	CO1, CO2
12.	Write short notes on rear and front pointers in array-based queues.	BL1	CO1
13.	Show the structure of a binary tree where level 0 has 1 node, level 1 has 2 nodes, and level 2 has 3 nodes.	BL3	CO3, CO6

**(PTO)**

14.	Discuss why binary search is faster than linear search for sorted data.	BL2	CO4, CO5
15.	Sort the list {38, 27, 43, 3, 9, 82, 10} using merge sort and show the steps.	BL3	CO4, CO6
16.	Explain the syntax of declaring and accessing structure members.	BL1	CO1
17.	Explain with suitable examples the differences between internal and external sorting.	BL2	CO4
18.	Design an algorithm to count the number of nodes in a singly linked list.	BL3	CO2

### Section C

**Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)**

19.	Explain the differences between adjacency list and adjacency matrix with examples.	BL2	CO3
20.	Define quick sort and explain its importance with an example.	BL1	CO4, CO5

**CO : Course Outcome**

**BL : Bloom's Taxonomy Levels** (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)