QP CODE: D3BCS2407	(Pages: 2)	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.	Define a tree in data structures.	BL1	CO3
2.	Illustrate the traversal process of a 1D array.	BL2	CO1
3.	State the characteristics of a weighted graph.	BL1	CO3
4.	Illustrate with an example the conversion of `A + B * C` into postfix form.	BL2	CO2
5.	Define sorting. List types of sorting.	BL1	CO3, CO4
6.	Discuss why insertion and deletion are easier in linked lists than in arrays.	BL2	CO1
7.	Illustrate an adjacency matrix for a graph with 3 vertices and 2 edges.	BL2	CO3
8.	Explain the property that relates number of leaf nodes and degree-2 nodes in a binary tree.	BL2	CO3, CO5, CO6
9.	Differentiate between open hashing and closed hashing.	BL2	CO4
10.	Explain why a stack is used in non-recursive inorder traversal.	BL2	CO3, CO6

Section B

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

11.	Illustrate the process of inserting a node in stack using linked list.	BL2	CO2
12.	Describe overflow and underflow conditions in array implementation of queue with examples.	BL1	CO2
13.	State the steps of inorder traversal with an example.	BL1	CO3

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14.	Discuss the working of bubble sort with an example of 5 elements.	BL2	CO4, CO5
15.	Apply quick sort on {12, 4, 5, 6, 7, 3, 1, 15} and show the partition process.	BL3	CO4
16.	Define structures. List their advantages over arrays.	BL1	CO1, CO2
17.	Explain with an example how merge sort divides and merges data.	BL2	CO4
18.	Apply deletion algorithm to remove node with value 15 from the list 10 → 15 → 20 → 30.	BL3	CO2
Section C			
Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)			
19.	Compare array and linked list representation for binary trees in terms of memory usage and performance.	BL2	CO3, CO5, CO6
20.	State the differences between linear search and binary search in detail.	BL1	CO4, CO6
	CO : Course Outcome		
	BL : Bloom's Taxonomy Levels (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)		