JHARKHAND Rai University
RANCHI

End Semester/Reappear (Semester III) Examination December, 2024

Programme:B. Tech CSE

Course: Data Structure and Algorithm **Full Marks: 70**

Course Code: 3PCCCS201 **Time: 3 Hrs.**

Enrolment no. _____

Q. No.	Questions	CO	Bloom Taxonomy Category	Marks
	Section I			
1	**Short Answer type questions**			**4 x 5 = 20**
a	What is binary search and why is it more efficient than sequential search on a sorted list structure?	CO1	Understand	
	or			
	Define Algorithm. Discuss the significance of algorithms in the context of problem-solving within computer science.	CO1	Understand	
b	What is a Queue? Write down its application in computer science.	CO1	Understand	
	or			
	Find the postfix, prefix and expression tree of the expression A+B*C-D/ (E+G).	CO1	Apply	
c	Compare and contrast AVL and BST.	CO2	Apply	
	or			
	What is directed, undirected and weighted graph?	CO2	Understand	
d	What are the different traversing methods in a binary tree? Explain with a clear example	CO1	Understand	
	or			
	What you mean by Hashing technique? Explain.	CO1	Remember	
	Section II			
Long Answer type questions				**3 x 10 = 30**
2	Why we need an asymptotic notation? Explain the different asymptotic notations with definition and example.	CO2	Analyze	
	or			
	Write notes on the following. a) Dequeues b) Circular Queues c) Priority Queue	CO2	Understand	
3	Evaluate the following expression using stack. 6*5+3-4/2	CO3	Understand	
	or			
	Create a Binary Search Tree for the following data and perform inorder, preorder and postorder traversal of the tree. 55, 66, 25, 44, 33, 77, 35, 10, 22, 65, 5.	CO3	Create	
4	Explain the Bubble Sort algorithm in detail, providing a step-by-step breakdown of the sorting process. Discuss the time complexity of Bubble Sort,	CO4	Apply	
	or			
	What is Heap sort? Explain it with the following given list of data and also discuss its time complexity. 78, 45, 23, 89, 65, 12, 90, 33.	CO4	Apply	
	Section III			
	Application based questions			**1 x 20 = 20**
5	Explain Linear Search .Write a comprehensive algorithm as well as C programs to implement the Linear Search algorithm. Ensure your program includes necessary comments. Demonstrate the functionality of your program by searching an array of integers. Discuss the time complexity of the Linear Search algorithm.	CO4	Analyze	
	or			

	Define a stack and state its fundamental characteristics. Subsequently, outline the step-by-step algorithm for both the PUSH and POP operations in a stack. Following the algorithmic description, provide a detailed implementation of these operations using an array-based approach.	CO4	Analyze	

COURSE OUTCOME

At the end of the course the candidate will able to

- CO1: Learn the basic types for data structure, implementation and application.
- CO2: Know the strength and weakness of different data structures.
- CO3::Use the appropriate data structure in context of solution of given problem.
- CO4: Develop programming skills which require solving given problem