

Question Bank Sem :3rd DIV A CSE Sub: Data Structure DST238914

Unit 1 Introduction to data structure CO1

1. Distinguish between linear and nonlinear data structure based on parameters
2. Write the time complexities of the given code and justify the same.
3. Explain the following algorithm time complexities with appropriate example
 - i) $O(1)$
 - ii) $O(n)$
 - iii) $O(n^2)$
 - iv) $O(n^3)$
4. Explain space complexity with example
5. Write algorithm for the given task (Refer Algm examples given in teams)
6. Distinguish b/w bottom up and top down approach of algorithm design with example
7. Classify the type of algorithms
8. Explain the following notations with example
 - i) Omega notation
 - ii) Big O notation
 - iii) Theta notation
9. Classify the type of loops .
10. Write an algorithm to add/remove an element from an array (demonstrate steps with the given array)

Unit 2 Sorting and Searching CO2

1. Write algorithm, Time complexity and space complexity for
 - i) Selection Sort
 - ii) Bubble Sort
 - iii) Insertion sort
 - iv) Linear search
 - v) Binary search
 - vi) Quicksort
2. Demonstrate the steps of following with a suitable example (array can be given ALSO IN QP)
 - i) Selection Sort
 - ii) Bubble Sort
 - iii) Insertion sort
 - iv) Linear search
 - v) Binary search
 - vi) Quicksort
3. Comparison of selection sort, bubble sort, insertion sort Quicksort

4. Comparison of linear search and binary search

Unit3 Static Linear Data Structure: Stacks and Queues CO3

1. Algorithm for push(), pop(), peek(), isempty() on stack with example diagram
2. Time complexities of operations performed on stack data structure
3. Explain stack as ADT using array with diagram
4. Memory allocation to different function calls in recursion and Recursion in stack with example and diagram.
5. Polish notations with example
6. Algorithm for Evaluation of postfix expression using stack
7. Demonstrate steps of Evaluation of postfix expression using stack with example and diagram representation (or the postfix expression to be evaluated will be given in QP)
8. Define queue Describe Array representation of queue with diagram
9. Classify Types of queues
10. Algorithm to insert and delete an element in a queue and explain with example
11. Algorithm to convert from infix to postfix
12. Demonstrate steps of conversion from infix to postfix expression using stack with example and diagram representation (or the infix expression to be converted will be given in QP)
13. advantage of circular queue over linear queue

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