

Questions of Data Structures

- Q1. What is a data structures?
- Q2. What are the two types of data structures? Give 2 examples of each?
- Q3. What are the two types of data structures?
- Q4. What are static and dynamic data structures?
- Q5. What are dense lists?
- Q6. Differentiate between static and dynamic memory allocation.
- Q7. What is heap memory used for?
- Q8. What do you understand by garbage collection? What is the other name for it? How does it take place in Java?
- Q9. What is a linked list? What is a node? What is header reference for a linked list?
- Q10. Differentiate between arrays and linked lists.
- Q11. Define and give 2 applications if a (i) Stack (ii) Queue.
- Q12. Why don't we have a linked circular queue?
- Q13. What is divide and conquer strategy? What are the three steps involved in it?
- Q14. How is a doubly linked list different from a singly linked list.
- Q15. What is a recursive data structure?
- Q16. What is a Binary tree? Show an example in three different representations.
- Q17. Define in relation to a Binary Tree: Root, Parent, Child, Predecessor, Successor, Ancestor, Descendants, Siblings, Edge, Path, Leaf, External nodes, Terminal nodes, Internal nodes, Branch, Degree, Level, Generation, Depth, Height, Subtree, left/right subtree, Full B'Tree, Complete B'Tree, Balanced Full B'Tree.
- Q18. What is a BST (give 2 full-forms). Give the property which is true for each node if a BST.
- Q19. Give Algorithms/functions for (tick here all you know, write in a separate sheet)

Stack	Push()	Pop()	Peek()	isEmpty()	Trav()	Queue	enqueue()	dequeue()	Peek()	isEmpty()	Trav()
Array Stack						Array Queue					
Fixed Top stack						Circular Queue					
Linked Stack						Linked Queue					
-						DE Queue	2	2			

- Q20. Give Algorithms/functions related to Singly, doubly and Circular Linked lists (tick here all you know, write in a separate sheet)

List	Ins at beg	Ins at end	Ins at pos	Ins in srtd	Del at beg	Del at end	Del at a pos	Del a val	traverse	Search	Merge	Split	Reverse	swap 1,2	swap any 2	Sort Mrg	Null
Singly																	
Doubly																	
Circular																	

- Q21. Give algorithms in relation to Trees: (tick here all you know, write in a separate sheet)

Tree	Preorder Traversal	Inorder Traversal	Postorder Traversal	Search	Sum of nodes	Count the nodes	Count height	Greatest value	Mirror
Binary									
BST									

- Q22. Taking standard assumptions, write functions to (tick here all you know, write in a separate sheet)

(i) Reverse a stack into another.	(ii) Transfer the even numbers in an array to a linked list.
(iii) Count the number of nodes of a tree.	(iv) Match parenthesis of an input expression (as a string) using a stack.
(v) Design a class for a Print Server (ISC 2008)	(vi) Infix - postfix conversion (using stacks)
(vii) Quick Sort	(viii) Merge Sort
(ix) Print the path to reach an node (from root) in a BST.	(x) Solve a Maze

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- Q25. Blank