NARAYANA ENGINEERING COLLEGE::GUDUR

AUTONOMOUS

DEPARTMENT OF MCA

MODEL QUESTION BANK

Class	**:** I MCA - II SEM	**AY ::** 2023-24
Course Title	**:** Data Structures **(21MC201)**	
Faculty	**:** Mrs. V.Surekha	**Branch:** MCA

S.No	Question	CO	BTL	Marks
	MODULE – I			
1	What is Data structure and Explain its Classifications of Data structure?	1	1	12
2	a. Classify Linear and Non Linear Data Structures b. Explain some applications of Data Structures?	1	2	8+4
3	a. What is an Algorithm and need of an Algorithm? b. Explain analysis of an algorithm?	1	1	6+6
4	Explain its Complexities of an algorithm with an example?	1		12
5	Explain Asymptotic Notations?	1		12
6	What is an Array and Explain representation of data in Arrays with an example?	1	1	12
7	a. Define Array ADT. b. Explain basic operations supported by an array with program example.	1	1	4+8
8	a. What is Searching? b. Explain different Searching techniques and their complexities?	1	1	4+8
9	Compare Linear search and Binary Search techniques?	1	2	12
10	Explain Linear Search technique an algorithm with an example?	1	1	12
11	Explain Binary Search technique an algorithm with an example?	1	1	12

MODULE – II				
1	What is a Stack? Explain representation of stack.	2	1	12
2	Explain the stack operations using an algorithm .	2	1	12
3	Describe in detail about any two applications of stack.	2	1	12
4	Explain an algorithm for evaluating arithmetic expression using Stack Data Structure? a. infix to postfix b. postfix to infix	2	1	6+6
5	a. What are the applications of stack? b. Extract the following infix expression to postfix expression? (A+B)/(C-D)-(E*F)	2	2	4+8
6	a. Define a Queue with an example? b. Explain the operations of Queue?	2	1	4+8
7	a. Define a Circular Queue? b. Explain the Insertion and Deletion operations on Circular Queue?	2	1	4+8
8	Give a brief description about the Double Ended Queue?	2	2	12
9	a. Explain about Priority Queues? b. Explain an algorithm to implement insert and delete operations on Priority Queue with an example?	2	1	6+6
10	a. Explain Applications of Queue? b. Differentiate Queue and Circular queue?	2	2	6+6
11	Explain algorithm to implement the queue operations.	2	1	12
MODULE – III				
1.	What is a Linked List? Explain various types of Linked List in detail?	3	1	12
2	Explain the single linked lists in detail.	3	1	12
3	What is a DLL? Explain the algorithm in detail for inserting and deleting a node from DLL?	3	1	12
4.	Explain in detail three applications of linked list with suitable example.	3	1	12
5.	Summarize about circular linked list.	3	2	12
6.	Explain the step by step process of Merge Sort with an example program.	3	1	12
7	How the queues are implemented using Linked List with an example?	3	2	12
8	a. What is Sorting? b. Summarize different types of sorting techniques.	3	2	2+10
9	Explain the step by step process of Bubble sort with an	3	1	12

	example program.			
10	a. Explain selection sort algorithm with an example. b. Explain insertion sort with an example .	3	1	6+6
11	Explain the step by step process of Quick Sort with an example program.	3	1	12
MODULE – IV				
1	a. Explain Binary tree traversing techniques with examples.	4	1	12
2	a. Define a Binary tree and its representation with an example? b. Summarize different types of binary tree.	4	2	6+6
3	Explain Binary tree operations with an example?	4	1	12
4	Describe the concept of trees for indexing.	4	3	12
5	Discuss about height balanced trees(AVL tree) and their operations with an example.	4	2	12
6	Define B Tree. Explain its operations with example.	4	1	12
7	Explain an algorithm to implement the following operations on Binary tree a) Insertion b) Deletion	4	2	6+6
8	a. Explain applications of Tree data structure? b. Write a program to insert and delete operation on B tree?	4	2	6+6
9	Write a Program to implement Binary Search Tree traversing operations.	4	3	12
10	a. Compare Binary tree and Height balanced binary tree. b. Why do we need height balanced trees? Illustrate with an example.	4	2	6+6
MODULE – V				
1.	a. What is a Graph? b. What are the basic terminologies in a Graph?	5	1	2+10
2.	Explain Graph traversal methods? Explain an algorithm with example.	5	2	12
3.	a. Define Shortest Path? b. Explain the representation of graphs.	5	2	2+10
4.	Explain about Topological Sorting with suitable example?	5	1	12
5.	Explain the concept of Minimum Spanning Tree using the following methods a) Prim's b) Kruskal's	5	1	6+6
6.	Apply Dijkstra's algorithm for finding the shortest path with an example.	5	3	12
7.	Explain the concept of Hashing and its types in detail?	5	1	12

8.	Explain warshall's Algorithm for finding shortest path and give an example.	5	1	12
9.	a. Explain in detail about Dynamic Hashing with an example? b. Explain in detail about Static Hashing with an example?	5	2	6+6
10.	a. Differentiate Static Hashing and Dynamic Hashing b. Explain operations of Hash table.	5	2	6+6

Name & Signature of the NECN Faculty	**Name & Signature of the NECG Faculty**	**Name & Signature of the NECN HOD**	**Name & Signature of the NECG HOD**

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