Department of Computer Science and Engineering
Question Bank - Academic Year (2021-22)

Course Code & Course Name	:	**19CSC01 & Data Structures and Algorithms**
Name of the Faculty	:	**P.Kaviya**
Year/Sem/Sec	:	**II/III/B**

Unit-I: Introduction
Part-A (2 Marks)

1. Define data structures

2. Define static data structures.

3. What are the different types of data structure?

4. Define linear data structures

5. What is variable and entity?

6. Give the Basic Operations on Data Structures

7. How we can measure efficiency

8. Define asymptotic analysis

9. List the Asymptotic Notations

10. List the type of Running Time Functions

Part-B (16 Marks)

1. Discuss in detail about Basic Terminologies and Elementary Data Organizations   (16)

2. Explain the Data Structure Operations in detail.   (16)

3. How we can Analyze the algorithm. Explain briefly about Analysis of an Algorithm, Asymptotic Notations and Time-Space trade off.   (16)

4. Write short notes on Linear Search and Binary Search Techniques and their complexity analysis.   (16)

5. Write Binary search algorithm and explain with example with its time complexity.   (16)

Unit-II : Stacks and Queues
Part-A (2 Marks)

1. Define recursion function

2. Define a stack

3. State the different ways of representing expressions

4. State the rules to be followed during infix to postfix conversions.

5. Define a priority queue

6. What are the applications of priority queue?

7. Write the algorithm to check balancing symbol

8. Mention the overflow condition in array implementation of Queue?

9. Differentiate LIFO and FIFO?

10. Define Max Heap

Part-B (16 Marks)

1. Write down and explain the operations performed in Stack ADT using array with its Algorithms and their complexity analysis (16)

2. Enumerate the Applications of Stacks with example (16)

3. Explain briefly about the operations for enqueue and dequeue on queue ADT using array with its Algorithms and their analysis (16)

4. Explain the basic concept of Circular Queue Operations with example (16)

5. List and Explain various operation of Circular Queue with example (16)

Unit-III : Linked List
Part-A (2 Marks)

1. Define dynamic memory allocation

2. Define structure

3. Define pointer

4. Define dynamic memory allocation

5. Define list and its types

6. List the advantages in using a linked list

7. Mention the advantages of representing stacks using linked lists than arrays

8. What are the two operations available in Queue?

9. Write the Algorithm for DEQUEUE operation

10. Mention the advantages of representing stacks using linked lists than arrays.

Part-B (16 Marks)

1. With suitable examples explain the operations performed on singly linked list. (16)

2. Discuss about the operations performed on doubly linked list with example (16)

3. Explain the operations performed on Circular Doubly linked list with example (16)

4. Write short notes i. array and structure (8)
   ii.pointer and recursion function (8)

5. Enumerate the operations of queue ADT using linked list (16)

Unit-IV : Trees
Part-A (2 Marks)

1. Define a tree

2. Define terminal nodes in a tree

3. Define a binary tree

4. Define a right-skewed binary tree

5. What is meant by binary tree traversal and list out the different binary tree traversal techniques

6. What are the basic operations performed in a binary search tree

7. List out the heap property

8. What are the tasks performed while traversing a binary tree?

9. Define a path in a tree.

10. What are the different ways of representing a binary tree?

Part-B (16 Marks)

1. Explain three standard ways of traversing a binary tree T with a recursive algorithm. (16)

2. Illusrate B Tree operations with their algorithms with Complexity analysis. (16)

3. Enumerate the algorithm for AVL. Show the result of inserting (16)
   15,17,6,19,11,10,13,20,8,14,12 one at time into an initially empty tree

4. Write an algorithm for inserting and deleting a node in a binary search tree (BST) with example (16)

5. With example explain the B+ Tree operation write the algorithms and its analysis (16)

Unit-V : Sorting and Hashing
Part-A (2 Marks)

1. Define Hashing

2. What do you mean by collision in hashing?

3. What do you mean by separate chaining?

4. What do you mean by open addressing?

5. List out various collision resolution techniques.

6. Define sorting and its type

7. What is Insertion Sort?

8. How Selection Sort operate?

9. Write the steps involved in Quick Sort

10. What do you mean by Probing?

Part-B (16 Marks)

1. Briefly describe hashing techniques with its collision resolution strategies   (16)

2. Describe in detail about insertion sort   (16)

3. With example enumerate the operation of selection sort   (16)

4. Discuss in detail about bubble sort   (16)

5. Illustrate the operation of Merge sort with explanation   (16)

Course Faculty   **HoD**