SRINIX COLLEGE OF ENGINEERING, BALASORE

**DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING**

ASSIGNMENT ON

DATA STRUCTURE

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<u>**Assignment–I**</u>

1. Explain how to sort the elements by using insertion sort and derive time complexity for the same. [12 M]

2. Write a Routine for sorting elements using quick sort method. Explain the working of the routing with an example. [12 M]

3. Explain how to sort the elements by using selection sort and derive the time complexity for the same. [12 M]

4. Discuss the Algorithm of merge sort with an example. Derive its time complexity.

[12 M]

5. Write and explain Bubble sorting Algorithm and also find its time complexity. [12 M]

6. Write and explain Radix sort algorithm with an example. [12 M]

7. What is searching? Explain Binary search algorithm with example and also find its time complexity. [12 M]

8. What is searching? Explain Binary search algorithm with example and also find its time complexity. [12 M]

9. Define hashing function. Explain any two Hashing functions with examples. [12 M]

10. Write a procedure for sorting a given list of elements using Quick sort method. Show the division of the list in the quick sort for a list of 10 numbers. [12 M]

Assignment–II

1. What is linked list? Write and explain the algorithm for crate and traverse operations in single linked list with example. [12 M]

2. What are the draw backs of single linked list? Write and explain the algorithm for search and modify operations in doubly linked list with example. [12 M]

3. a). Explain the advantages of linked list over arrays. [6 M]

   b). Write algorithm for insert and delete a node from doubly linked list. [6 M]

4. a). Explain the circular linked list in detail. [6 M]

   b). What is the draw backs of single linked list? Explain how to implement insert and traverse operations in circular linked list. [6 M]

5. a). What is sparse matrix? Write an algorithm for implement sparse matrix. [6 M]

   b). write an algorithm for insertion operation in circularly doubly linked list. [6 M]

6. What is Linked list? Explain applications of linked list. [6 M]

7. a). Discuss in detail about the polynomial representation. [6 M]

   b). Explain with suitable example, the sort operation of single linked list. [6 M]

8. a). Explain the doubly linked list in detail. [6 M]

   b). Explain creation and deletion operations in circular linked list. [6 M]

9. What is linked list? Write and explain the algorithm for crate, insertion and traverse operations in doubly linked list with example. [12 M]

10. What are the draw backs of arrays? Write and explain the algorithm for search and modify operations in single linked list with example. [12 M]

1.   a). Explain the solution to the towers of Hanoi problem. Assume the number of
      disks as three.   [6 M]

      b). How to store the stack using arrays? Explain with example.   [6 M]

2.   Write a procedure to convert an infix expression into postfix form. Explain it by an
      example.   [12 M]

3.   What is stack? Explain any two applications of stack with examples.   [12 M]

4.   What is stack? Write algorithm for operations of stack with examples.   [12M]

5.   What are the limitations of queue? Explain the algorithms for various operations of
      circular queue.   [12 M]

6.   Give brief description about the priority queues.   [12 M]

7.   What is double ended queue? Discuss the operations of Double ended queue.[12 M]

8.   a). What are the applications of queue?   [6 M]

      b). How to store stack using linked list? Explain with example.   [6 M]

9.   What are priority queues? Explain in detail with example.   [12 M]

10.   a). Write a function that returns the ncr value using recursive function. [6 M]

      b). Write any four applications of queues.   [6 M]

1. a). What is a binary search tree? How do you insert an element into a binary search tree?

   [6 M]

   b). What is traversing? Write recursive procedure for in order traversal in a binary tree.

   [6 M]

2. a). Explain how to delete an element from the binary search tree.   [6 M]

   b). Write recursive algorithm for pre order traversal.   [6 M]

3. a). Discuss threaded binary trees.   [6 M]

   b). Explain height balance tree.   [6 M]

4. Discuss about Red-Black and Splay trees.   [12 M]

5. Write insertion, deletion and searching operations on AVL trees.   [12 M]

6. Discuss B-Trees.   [12 M]

7. What is binary search tree? How to implement searching and insertion operations on Binary search tree.   [12 M]

8. What is binary search tree? How to implement recursive traversal techniques on binary search tree. Discuss with an example.   [12 M]

9. What is B-tree of order m.? Write insertion and deletion operations on the same. [12 M]

10. What is heap? Explain algorithm for heap sort with an example.   [12 M]

Assignment–V

1. Explain DFS algorithm with example.   [12 M]

2. Explain BFS algorithm with example.   [12 M]

3. Discuss how to represent graph storage using Adjacency matrix.   [12 M]

4. What is minimum –cost spanning tree? Discuss Prim's algorithm with example. [12 M]

5. What is minimum –cost spanning tree? Discuss Kruskal's algorithm with example.[12 M]

6. Explain Dijkstra's algorithm with an example.   [12 M]

7. Discuss Floyd's algorithm.   [12 M]

8. With an example discuss Warshall's algorithm.   [12 M]

9. Define graph. Explain various operations on graphs.   [12 M]

10. Explain any algorithm for all pairs shortest path problem.   [12 M]