## Vidyalankar School of Information Technology SYBSc IT Semester III

Subject: Data Structures

Faculty Members: Dr. Kimaya Shelar, Shajil Kumar

## **Remedial Questions**

What is an algorithm? What are the characteristics of an algorithm?  Explain the memory representation of one dimensional array with an example Suppose an array A having base address as 2500 and each element takes 8 memory cells and the array's starting index is 9 then calculate the address of element at index 20 in the array 0.517,-3:6]. If the base address of D is 1536 and each element takes 2 memory cells then find the address of D[6][0] element assuming: Array D stored in Row major order  Array D stored in Row major order  Write an algorithm for linear search in an array  Write an algorithm for binary search in an array  Explain the differences between binary search and linear search  Write an algorithm for performing traversing array elements operations on an array unit – II  Write and explain an algorithm to traverse the elements in one-way(single) linked list  Write and explain an algorithm to search and find location of a desired element in one-way(single) linked list  Write and explain an algorithm to insert a node at the beginning of one-way(single) linked list singly linked list  Write and explain an algorithm to insert a node at the end of one-way(single) linked list  Write and explain an algorithm to insert a node at the end of one-way(single) linked list  Write and explain an algorithm to delete a node from the end of one-way(single) linked list  Write and explain an algorithm to delete a node from a position of one-way(single) linked list  Write and explain an algorithm to delete a node from a position of one-way(single) linked list  Write and explain an algorithm to perform Pop operation in stack data structure, also check stack is full or not  Write an algorithm to perform Pop operation in stack data structure, also check stack is empty or not  Write an algorithm to perform Pop operation in stack data structure, also check stack is empty or not  Convert the following expression in postfix and prefix notations  (x * y) + (z + ((a + b - c) * d)) - 1 * (j / k)  Convert the given infix to postfix e		<u>Remediai Questions</u>	
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singly linked list  Write and explain an algorithm to insert a node at the end of one-way(single) linked list  Write and explain an algorithm to insert a node at a position of one-way(single) linked list  Write and explain an algorithm to delete a node from the end of one-way(single) linked list  Write and explain an algorithm to delete a node from a position of one-way(single) linked list  Unit – III  Write an algorithm to perform Push operation in stack data structure, also check stack is full or not  Write an algorithm to perform Pop operation in stack data structure, also check stack is empty or not  Write an algorithm to perform Peek operation in stack data structure, also check stack is empty or not  Convert the following expression in postfix and prefix notations  (x * y) + (z + ((a + b - c) * d)) - I * (j / k)  Convert the given infix to postfix expression using stack  8 - 2 + (3 * 4) / 2 ^ 2  Write an algorithm to perform dequeue (deletion) operation in queue / circular queue data structure, also check queue is empty or not  Write an algorithm to perform enQueue (insertion) operation in queue / circular queue data			
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<ul> <li>not</li> <li>Write an algorithm to perform Pop operation in stack data structure, also check stack is empty or not</li> <li>Write an algorithm to perform Peek operation in stack data structure, also check stack is empty or not</li> <li>Convert the following expression in postfix and prefix notations (x * y) + (z + ((a + b - c) * d)) - I * (j / k)</li> <li>Convert the given infix to postfix expression using stack 8 - 2 + (3 * 4) / 2 ^ 2</li> <li>Write an algorithm to perform dequeue (deletion) operation in queue / circular queue data structure, also check queue is empty or not</li> <li>Write an algorithm to perform enQueue (insertion) operation in queue / circular queue data</li> </ul>	Unit – III		
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7 Write an algorithm to perform enQueue (insertion) operation in queue / circular queue data	6		
structure, also check queue is full or not	7		
		structure, also check queue is full or not	

8	Write an algorithm to perform getFront operation in queue / circular queue data structure,	
	also check stack is empty or not	
Unit – IV		
1	Sort the numbers using Bubble sort.	
2	Sort the number using Insertion sort.	
3	Sort the number using Selection sort.	
4	Sort the numbers using merge sort.	
5	Reconstruct the binary tree whose inorder and preorder traversals are given	
6	Reconstruct the binary tree whose inorder and postorder traversals are given	
7	Write an algorithm to perform In-Order traversal of any particular binary tree	
8	Write an algorithm to perform Post-Order traversal of any particular binary tree	
Unit – V		
1	Explain Adjacency Matrix representation of Graph	
2	Explain Adjacency List representation of Graph	
3	Explain the memory representation of Weighted Graph	
4	What is Graph? Explain different types of Graphs	
5	Define the following terms related to Graph 1) Degree, Outdegree and Indegree	
	2) Source and Sink 3) Adjacent Vertices 4) Loop 5) Path	
6	Find the minimum spanning tree for the following graph using Prim's algorithm and starting	
	vertex	
7	Write a short note on Mid-Square Hashing method	
8	Write a short note on Division Remainder Hashing method	

Signature of Faculty Members

Name:

1) Dr. Kimaya Shelar

2) Shajil Kumar

Signature of In-Charge

Name: Dr. Pallavi Tawde

Name of Cluster: Software Development