Vidyalankar School of Information Technology
SYBSc IT Semester III
Subject: *Data Structures*
Faculty Members: Dr. *Kimaya Shelar*, *Shajil Kumar*
Remedial Questions

Unit – I	
1	What is data structure? Explain different classification of data structure
2	What is an algorithm? What are the characteristics of an algorithm?
3	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
4	Consider a two dimensional array D[5:7,-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 Column major order
5	Write an algorithm for linear search in an array
6	Write an algorithm for binary search in an array
7	Explain the differences between binary search and linear search
8	Write an algorithm for performing traversing array elements operations on an array
Unit – II	
1	Write and explain an algorithm to traverse the elements in one-way(single) linked list
2	Write and explain an algorithm to find the largest element in one-way(single) linked list
3	Write and explain an algorithm to search and find location of a desired element in one-way(single) linked list
4	Write and explain the algorithm to insert a node at the beginning of one-way(single) linked list singly linked list
5	Write and explain an algorithm to insert a node at the end of one-way(single) linked list
6	Write and explain an algorithm to insert a node at a position of one-way(single) linked list
7	Write and explain an algorithm to delete a node from the end of one-way(single) linked list
8	Write and explain an algorithm to delete a node from a position of one-way(single) linked list
Unit – III	
1	Write an algorithm to perform Push operation in stack data structure, also check stack is full or not
2	Write an algorithm to perform Pop operation in stack data structure, also check stack is empty or not
3	Write an algorithm to perform Peek operation in stack data structure, also check stack is empty or not
4	Convert the following expression in postfix and prefix notations (x * y) + (z + ((a + b - c) * d)) – l * (j / k)
5	Convert the given infix to postfix expression using stack 8 – 2 + (3 * 4) / 2 ^ 2
6	Write an algorithm to perform dequeue (deletion) operation in queue / circular queue data structure, also check queue is empty or not
7	Write an algorithm to perform enQueue (insertion) operation in queue / circular queue data 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

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Name of Cluster: Software Development