

**SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE****(An Autonomous Institution)**

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
 (Accredited by NBA-AICTE, New Delhi, Accredited by NAAC with "A" Grade)
 Madagadipet, Puducherry - 605 107

**B. TECH END SEMESTER EXAMINATIONS, MAY 2023****III SEMESTER****ELECTRONICS AND COMMUNICATION ENGINEERING****DATA STRUCTURES (U19ECT32)****Duration: 3 hrs.****Max. Marks- 75****Note: B.L – Bloom's Level CO- Course Outcome**

Q. No		Marks	B.L	CO's
PART A (10 x 2=20 Marks)				
Answer all the Questions				
Q.1	Define time complexity and space complexity.	2	1	CO1
Q.2	Difference between Linear data structure and Non-Linear Data structure.	2	1	CO1
Q.3	Define Double ended queue.	2	2	CO2
Q.4	State the advantages of using infix notations.	2	1	CO2
Q.5	How can we insert a new node as a first node?	2	2	CO3
Q.6	What are the operations performed in DLL?	2	1	CO3
Q.7	Give some Properties of Binary Tree.	2	2	CO4
Q.8	Define non-terminal nodes in a tree.	2	2	CO4
Q.9	What is sorting algorithm?	2	1	CO5
Q.10	Define Hashing.	2	1	CO5
PART B (5 x 5 = 25 Marks)				
Answer all the Questions				
Q.11	Explain lower bound and upper bound theory of algorithm.	5	4	CO1
Q.12	Explain the conversion of Infix to Postfix expression using Algorithm.	5	3	CO2
Q.13	Explain the implementation of linked stack with example.	5	3	CO3
Q.14	Explain the b+ tree.	5	3	CO4
Q.15	Explain the Depth first search technique in detail.	5	2	CO5
PART C (3 x 10 =30 Marks)				
Answer any THREE Questions				
Q.16	Write about asymptotic notations and their properties	10	3	CO1
Q.17	Write an algorithm for a doubly ended queue for insertion and deletion Double Ended Queue.	10	4	CO2
Q.18	What is a linked list? Explain the different operations performed in a linked list.	10	4	CO3
Q.19	Explain Tree Traversal techniques with its implementation and example.	10	3	CO4
Q.20	Explain Prim's Algorithm in detail and find the Minimum Spanning Tree for the below graph.	10	4	CO5

B. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022

III SEMESTER

Common to EEE, ECE, CSE, IT, ICE, MECH, CIVIL, BME, MCTR, CCE

DATA STRUCTURES (U20EST356)

Duration: 3 hrs.

Max. Marks- 75

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
PART A (10 x 2=20 Marks)				
Answer all the Questions				
Q.1	How to define the efficiency of an algorithm?	2	2	CO1
Q.2	Define array with its basic operations.	2	1	CO1
Q.3	Compare the working of stack and queue data structure.	2	3	CO2
Q.4	Define circular queue and its advantages.	2	2	CO2
Q.5	Draw the representation of singly and doubly linked list.	2	2	CO3
Q.6	List out the different types of insertion that can be done in doubly linked list.	2	2	CO3
Q.7	Justify that if the depth of the binary tree is k, the maximum number of nodes in the binary tree is 2^k-1 .	2	3	CO4
Q.8	What are the various rotations in AVL trees?	2	1	CO4
Q.9	When do you say a graph is bi-connected?	2	2	CO5
Q.10	Define graph and its types?	2	1	CO5
PART B (5 x 5 = 25 Marks)				
Answer all the Questions				
Q.11	Explain the Big O and omega asymptotic notation used for specifying the growth rate of functions.	5	2	CO1
Q.12	Write a C program for performing dequeue operation in a queue using array.	5	3	CO2
Q.13	Explain about circular linked list and its operations.	5	2	CO3
Q.14	What are the steps to convert a general tree to binary tree?	5	3	CO4
Q.15	Explain the bubble sort and selection sort algorithms.	5	2	CO5
PART C (3 x 10 =30 Marks)				
Answer any THREE Questions				
Q.16	Write a program to search an element using binary search technique.	10	3	CO1
Q.17	Describe the process of infix to postfix and infix to prefix expression with example.	10	2	CO2
Q.18	Write a program to implement linear linked list showing the operations that can be performed on a linked list.	10	3	CO3
Q.19	Explain the following operations on a binary search tree with suitable examples i. Find a node ii. Find the maximum and minimum elements of binary search tree	10	3	CO4
Q.20	Differentiate depth-first search and breadth-first search traversal of a graph with suitable examples.	10	3	CO5

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Madagadipet, Puducherry - 605 107**B. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022****III SEMESTER****Common to ECE, IT, ICE****DATA STRUCTURES (U19ECT32, U19ITT32, U19ICT32)****Duration: 3 hrs.****Max. Marks- 75***Note: B.L – Bloom's Level CO- Course Outcome*

		Marks	B.L	CO's
PART A (10 x 2=20 Marks)				
Answer all the Questions				
Q.1	Differentiate between Array and Linked List.	2	4	CO1
Q.2	Define ADT.	2	1	CO1
Q.3	List down the applications of stack	2	1	CO2
Q.4	List down the applications of queues.	2	1	CO2
Q.5	Illustrate Singly Linked List with neat sketch.	2	3	CO3
Q.6	What are the advantages of Circular Linked List?	2	1	CO3
Q.7	Write short notes on threaded binary tree.	2	4	CO4
Q.8	Write an algorithm for post-order traversal of binary tree.	2	4	CO4
Q.9	Brief about Extendible hashing	2	2	CO5
Q.10	Define Hash Table and Hash function with an example.	2	1	CO5
PART B (5 x 5 = 25 Marks)				
Answer all the Questions				
Q.11	Define linear search. Write a routine to search an element in the list using linear search.	5	1	CO1
Q.12	Write a procedure to convert infix expression to postfix expression using the expression $a+b*c+(d*e)$	5	4	CO2
Q.13	Write a routine to insert a node before a given node in the linked list	5	2	CO3
Q.14	Explain tree traversal techniques with an example.	5	2	CO4
Q.15	Define selection sort. How many passes are needed for sorting an element in the list?	5	1	CO5
PART C (3 x 10 =30 Marks)				
Answer any THREE Questions				
Q.16	Discuss in detail about Linear and Binary searching techniques with an example	10	2	CO1
Q.17	Define Stack. List down the different stack operations. Write a routine to push and pop an element in the stack.	10	1	CO2
Q.18	What is meant by doubly linked list? Create a node in the doubly linked list and write routine to perform the different types of operations in the doubly linked list.	10	2	CO3
Q.19	Write a routine for AVL tree insertion. Insert the following elements in the empty tree and how do you balance the tree after each element insertion? Elements : 2, 5, 4, 7, 8, 6, 9, 1, 11	10	6	CO4
Q.20	Explain Selection sort. Sort the following elements using selection sort 42, 23, 11, 65, 74, 87, 98, 45.	10	2	CO5



B. TECH END SEMESTER EXAMINATIONS, OCTOBER 2022

III SEMESTER

Common to EEE, ECE, CSE, IT, ICE, MECH, CIVIL, BME, MCTR, CCE

DATA STRUCTURES (U20EST356)

Duration: 3 hrs.

Max. Marks- 75

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
PART A (10 x 2=20 Marks)				
Answer all the Questions				
Q.1	What is time complexity and space complexity of an algorithm?	2	1	CO1
Q.2	Distinguish between linear search and binary search.	2	2	CO1
Q.3	Write the steps to check whether a stack is full or empty.	2	3	CO2
Q.4	Define priority queue and its types.	2	1	CO2
Q.5	Compare Singly and Doubly linked list.	2	2	CO3
Q.6	List the operations that can be performed using linked list.	2	1	CO3
Q.7	For the given binary search tree, if we remove the root and replace it with a node from left subtree, what will be the value of the new root? Justify your answer.	2	3	CO4
Q.8	Define the balance factor of AVL Tree.	2	2	CO4
Q.9	Define sorting and its types.	2	1	CO5
Q.10	Differentiate cyclic and acyclic graph.	2	2	CO5
PART B (5 x 5 = 25 Marks)				
Answer all the Questions				
Q.11	Explain in brief about linear search with its appropriate algorithm.	5	2	CO1
Q.12	Convert the infix expression to prefix expression using stack $A+B*(C-D)/(P-R)$.	5	2	CO2
Q.13	Write a C program to design one function "Delete_beg" to delete a node from the beginning of a singly linked list.	5	3	CO3
Q.14	Construct B Tree to insert the following key elements (order of the tree is 3) 5,2,13,3,45,72,4,6,9,22.	5	3	CO4
Q.15	Describe the algorithm for insertion sort and shell sort.	5	2	CO5
PART C (3 x 10 =30 Marks)				
Answer any THREE Questions				
Q.16	Write a C program to insert, delete and search an element in array data structure.	10	3	CO1
Q.17	Illustrate the enqueue and dequeue operations on double ended queue.	10	2	CO2
Q.18	Write a C program to explain the steps involved in insertion and deletion for both singly and doubly linked list.	10	3	CO3
Q.19	Suppose the following list of letters is inserted in order into an empty binary search tree: J,R,D,G,T,E,M,H,P,A,F,Q i. Construct the binary search tree ii. Find the in-order, pre-order and post-order traversal of BST created	10	3	CO4
Q.20	Explain graph traversal with example.	10	2	CO5