This document is a part of Main Course File	Document No.: CFM – 8

	SARDAR VALLABHBHAI PATEL EDUCATION SOCIETY MANAGED **N. G. PATEL POLYTECHNIC**
	COMPUTER ENGINEERING DEPARTMENT

FORMAT FOR ASSIGNMENTS	

Course Name (With Code): Data Structure and Algorithms (4330704)

Semester / Year: Third/Second

Assignment Number: 1

Assignment CO Number: 4330704.a

Sr. No.	Questions related to Course Outcomes
Part – A	**Questions carrying 2 Marks**
1	Define: Data structure. List out different types of Data Structure.
2	Differentiate data and information.
3	Explain Row major array
4	Differentiate List and Arrray.
5	Define Worst case,Best case,Average Case, Time complexity and Space complexity.
6	Define Big-O notation ,Big Omega Notation, Big Theta Notation.
7	Write down key features of algorithm.
Part – B	**Questions carrying 3 Marks**
1	Give definition of an algorithm. Explain key features of an algorithm.
2	Define array. Explain Row Major Array and Column Major array with example.
3	Write an algorithm for sequential search.
4	Explain binary search method with example
5	Explain Asymptotic Notation.
Part – C	**Questions carrying 4 Marks**
1	What is Data Structure? Explain types of data structure with example.
2	Differentiate: Primitive data structures v/s Non-primitive data structures

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FORMAT FOR ASSIGNMENTS	
Course Name (With Code): Data Structures and Algorithms (4330704)	
Semester / Year: Third/Second	
Assignment Number: 2	
Assignment CO Number: 4330704.b	
Sr. No.	**Questions related to Course Outcomes**
Part – A	**Questions carrying 2 Marks**
1	Explain the difference between Simple Queue and Circular Queue.
2	Write down recursive function.
Part – B	**Questions carrying 3 Marks**
1	Write down the applications of Stack
2	Convert this Infix expression into Postfix expression: A+B/C*D-E/F-G
3	Write short note: stack applications.
4	Differentiate between stack and queue.
5	Explain circular queue.
Part – C	**Questions carrying 4 Marks**
1	Explain PUSH and POP opration on stack with diagrams.
2	Write and explain algorithm for Insert operation on Simple Queue with diagrams.
3	Define: Queue. Write algorithm to delete element from queue.
4	Convert a+b*(c/d) – e into postfix expression
5	Convert (a + b) * c – (d – e) into postfix expression
Part – D	**Questions carrying 7 Marks**
1	Justify: "Circular queue is better than linear queue."
2	Convert the following infix expression into postfix expression. a + b * c / d * e – f + g * h / i
3	Write a short note on: Stack
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FORMAT FOR ASSIGNMENTS

Course Name (With Code): Data Structures and Algorithms (4330704)

Semester / Year: Third/Second

Assignment Number: 3

Assignment CO Number: 4330704.c

Sr. No.	Questions related to Course Outcomes
Part – A	**Questions carrying 2 Marks**
1	Define Pointer and explain its use with an example
2	Define: singly link list
3	Define: Pointer, structure
4	Write applications of linked list.
Part – B	**Questions carrying 3 Marks**
1	List out the main advantages of using Linked List
2	Explain Circular Linked List with its disadvantages.
3	Write a C function to count the number of nodes in Singly Linked List
4	Write algorithm to delete node from beginning in singly linked list.
Part – C	**Questions carrying 4 Marks**
1	Write an algorithm to Insert at the End in a Singly Linked List.
2	Differentiate between Singly Linked List and Doubly Linked List.
3	Write an algorithm to Insert at beginning in a Doubly Linked List.
4	Write a C function to perform Insert operation in Ordered Singly Linked List. Explain with neat diagrams.
5	Write algorithm to search given node in singly link list
6	Write short note: Doubly linked list.
7	Write short note: DMA
Part – D	**Questions carrying 7 Marks**
1	Write an algorithm to insert a node at the end of a Singly linked list.
2	Explain: Circular linked list. Identify and explain differences between singly linked list and circular linked list.
3	Write an algorithm to delete a node from the Singly linked list.
4	Write an algorithm to count total number of nodes in a Doubly linked list.
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FORMAT FOR ASSIGNMENTS	
Course Name (With Code): Data Structures and Algorithms (4330704)	
Semester / Year: Third/Second	
Assignment Number: 4	
Assignment CO Number: 4330704.d	
Sr. No.	**Questions related to Course Outcomes**
Part – A	**Questions carrying 2 Marks**
1	Define Binary Search Tree with an example
2	Define Sibling and Leaf node for Tree data structure.
3	Define: BST
4	Define: forest, leaf node
5	Define Forest and Indegree.
6	Define: sibling, root node
Part – B	**Questions carrying 3 Marks**
1	Write and explain Inorder traversal algorithm with an example.
2	Create BST for the following data. 4 3 8 2 1 6 9 5 7
3	Write algorithm for post-order tree traversal method.
4	Define Tree. Explain applications of tree.
5	What is Tree Traversal? Write an algorithm for Inorder Traversal
Part – C	**Questions carrying 4 Marks**
1	Create a Binary Search Tree for the keys 25, 45, 12, 18, 65, 35, 58, 8 and write the Preorder and Postorder traversal sequences.
2	Construct a binary search tree for following data items. 25, 15, 35, 30, 20, 40, 10. (Consider 25 as a root node.)
3	Explain the technique for converting General tree into a Binary Tree with example
4	What is Tree Traversal? Write an algorithm for Inorder Traversal.
5	Define Binary Tree. List Operations on Binary Tree. Explain any one operation in detail.
6	Explain Conversion of general tree to binary tree with suitable example.
7	Define following with necessary figure/example (1) Indegree (2) Leaf Node (3) Directed Edge (4) Path
Part – D	**Questions carrying 7 Marks**
1	Write an algorithm for pre-order tree traversal method.
2	Define: binary tree, complete binary tree, strict binary tree.
3	Construct a binary search tree for following data items. 25, 15, 35, 30, 20, 40, 10. (Consider 25 as a root node.) Delete 10 and 35 from this tree and reconstruct the tree

4	Construct a binary search tree for following data items. 100, 150, 120, 50, 75, 25, 200. (Consider 100 as a root node.) Provide in-order and pre-order traversal for this tree
5	Create BST for the following data: 8, 3, 10, 1, 6, 4, 7, 14, 13 Give pre-order, in-order, post-order tree traversal for that tree.

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FORMAT FOR ASSIGNMENTS

Course Name (With Code): Data Structure & Algorithms (4330704)

Semester / Year: Third/Second

Assignment Number: 5

Assignment CO Number: 4330704.e

Sr. No.	Questions related to Course Outcomes
Part – A	**Questions carrying 2 Marks**
1	Define sorting. List out different sorting methods.
2	What is Collision in Hashing.
3	Define Hashing.
4	Explain Division method for Hashing in brief.
Part – B	**Questions carrying 3 Marks**
1	Write an algorithm for selection sort.
2	Explain bubble sort with example.
Part – C	**Questions carrying 4 Marks**
1	Write an algorithm for quick sort method.
2	Write an algorithm for insertion sort method.
3	Write an algorithm for merge sort method.
4	Explain Collision Resolution Techniques.
5	Explain any two hashing techniques.
6	Write a C program for Quick Sort.
Part – D	**Questions carrying 7 Marks**
1	What is Hashing? Explain any one Hashing function in detail.
2	Write a C program for merge sort.
3	Give tracing of following list of number using Radix Sort 123,456,342,789,90,2,875,453,290,99.
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