SAPTHAGIRI NPS UNIVERSITY
BE 1st Semester End Examination 2024-25

Course Code: 24BEELY106 **Semester:** I
Course: Fundamentals of Data Structure **SRN**:
Time: 3 hours **Max Marks**: 100

PART –A

Answer any Ten of the following **2x10=20**

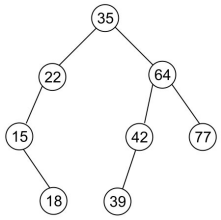
1	What is an algorithm? List the characterstics of it.	L2
2	Describe any two asymptotic notations with examples	L2
3	What is the memory allocated in bytes for the follwing arrays: int arr[4]; int mat[3][3];	L3
4	What is dynamic memory allocation?	L2
5	Define Link Lists.	L1
6	What is a Stack? What behaviour does it exhibit?	L2
7	What is a Stack? What behaviour does it exhibit?	L2
8	What is the disadvantage of a linear queue?	L3
9	Define Complete Binary Tree with a example	L2
10	What is Adjacency Matrix?	L2
11	What is a cycle in the graph?	L2
12	What property should the input elements satisfy for performing Binary Search?	L3

PART –B

Answer any Seven of the following **5 x 7 =35**

1	Write an algorithm for inserting an element into an array.	L2
2	List any 5 non primitive data structures with there applications.	L2
3	Describe the pop operation on the stack with a suitable C function.	L2
4	Develop a C function to delete an element from a singly linked List.	L3

5	Describe the Delete Front operation in a Linear queue with an example and corresponding C function.	L2
6	For the given tree below, illustrate graphically the contents of the tree after each operation for performing the following delete operations successively i. Delete the node containing 15 ii. Delete the node containing 42	L2

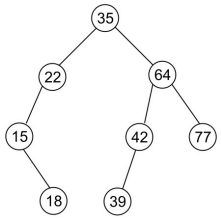


7	Design and develop a C function to insert an element into a Binary Search Tree.	L3
8	Write an algorithm for the BFS graph traversal method.	L2
9	Sort the following elements using Insertion Sort. Show the complete trace of the sorting procedure.	L3

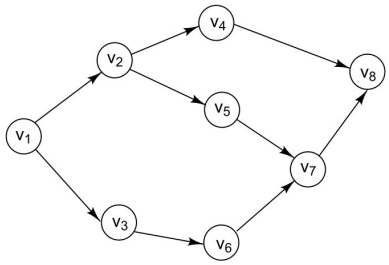
PART – C

Answer any Three of the following **15 x 3 =45**

1	a) Outline any two asymptotic notations used to measure the performance of algorithms. (8)	L2
	b) Design and Develop a C program to multiply two matrices (7)	L3
2	a) Explain the different types of linked lists with suitable graphical illustrations (8)	L2
	b) Design and Develop a C program to implement a stack using arrays (7)	L3
3	a) Explain the working of a Circular queue and its operations with a suitable example (8)	L2
	b) Write C functions to perform Delete Rear and Insert Front operations on a Double ended queue (7)	L3
4	a) Design and develop a C function to delete an element from a Binary Search Tree. (8)	L2
	b) Obtain the three traversals on the following Binary Tree. (7)	L3



5 a) Write an algorithm to perform Breadth First Search traversal on a graph. Obtain the BFS traversal on the following graph. (8) L3



b) Write a C program to sort a list of elements using Selection Sort technique. (7) L3