Hall Ticket Number:

Code No. : 14168 AS N

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. IV-Semester Advanced Supplementary Examinations, Aug./Sep.-2023

Principles of Data Structures

(Common to Civil & Mech. Engg.)

Time: **3 hours**   Max. Marks: **60**

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Outline various types of data structures.	2	1	1	1,2
2.	Define Linked List with an example.	2	1	1	1,2
3.	Define Queue. What are the conditions to check whether queue is empty or full?	2	1	2	1,2
4.	Evaluate the following expression 5 3 * 9 + 6 / 8 4 / +	2	1	2	1,2
5.	Illustrate binary tree with an example.	2	1	3	1,2
6.	How to represent binary tree using arrays for the below given tree?	2	1	3	1,2

Q. No.	Stem of the question	M	L	CO	PO
7.	Write the adjacency matrix for the given graph below:	2	1	4	1,2

Q. No.	Stem of the question	M	L	CO	PO
8.	What is a graph? Explain the properties of graphs.	2	1	4	1,2
9.	Compare and Contrast between linear search and binary search.	2	2	5	1,2
10.	Sort the given list of numbers using Insertion Sort. **64,57,32,45,9,12,18,70**	2	2	5	1,2

Part-B (5 × 8 = 40 Marks)

Q. No.	Stem of the question	M	L	CO	PO
11. a)	Develop a C Program to create a single linked list for the following data: 7, 5, 6, 4, 2 and perform the following operations: a. Insert node 1 before 7 and display. b. Delete a node which consists an element 1 and display.	4	3	1	1,2
b)	Compare and Contrast between Linked List and Array Data Structures.	4	2	1	1,2
12. a)	Design a "C" code for the following operations of the stack 1) push (28) 2) pop ( ) 3) display ( ).	6	3	2	1,2
b)	Differentiate between stacks and queues.	2	2	2	1,2

			M	L	CO	PO
16.	a)	Explain dynamic memory allocation of a two dimensional array, using an example.	4	2	1	1
	b)	Write functions in C to implement and explain the 'pop' operation of a Stack.	4	3	2	2
17.		Answer any *two* of the following:				
	a)	Write a function in C to discuss the working of the 'dequeue()' operation.	4	3	3	2
	b)	Discuss how the enqueue operation works in a Queue implemented using Linked Lists.	4	2	4	1
	c)	Write a C program to implement the Breadth First Search algorithm on a Graph ADT.	4	3	5	2

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	33%
iii)	Blooms Taxonomy Level – 3 & 4	47%

*****