

Hall Ticket Number:

Code No. : 13648 S

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (I.T.) III-Semester Supplementary Examinations, August-2022

Data Structures

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.	Define time complexity and space complexity.	2	1	1	1
2.	List any two applications of Stack.	2	1	2	1
3.	Compare Queues and Circular queues.	2	2	2	1
4.	List any two applications of Linked List.	2	1	2	1
5.	Compare full binary tree and complete binary tree.	2	2	3	1
6.	Construct postorder traversal by traversing the given tree.	2	2	3	1
	<pre> graph TD A((A)) --- B((B)) A --- C((C)) B --- D((D)) C --- E((E)) C --- F((F)) E --- G((G)) F --- H((H)) F --- I((I)) </pre>				
7.	Define B-Tree.	2	1	4	1
8.	Identify which data structure is used to implement Breadth First Search.	2	3	4	2
9.	Define Static Hashing.	2	1	5	1
10.	What is the average case, and worst case time complexity of Linear Search?	2	1	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Compare Big-O notation and Omega notation with an example.	3	2	1	1
b)	Calculate the value of the expression 95- 84/* using the function show complete tracing .Write a function for evaluation of postfix expression.	5	3	2	2
12. a)	Explain the following operations by implementing Singly linked list.	3	2	2	1
	a) Insert new node at the beginning of the list.				
	b) Delete the last node.				
	c) Display the elements.				

Contd... 2

	b)	Write a function to count no of nodes in the Linked list.	5	3	2	2
13.	a)	Construct a Binary Tree for the following sequence of numbers. 45,32,90,34,68,72,15,24 Traverse the Binary Tree created in Inorder.	3	2	3	1
	b)	Write a function to find maximum element in a binary tree.	5	3	3	2
14.	a)	Show how the following elements are inserted into a B-Tree of order 5. 12, 34, 56, 69, 5, 3, 17, 25, 32, 47, 63, 50, 29, 19.	5	3	4	2
	b)	Illustrate the significance of Depth First Search with an example.	3	2	4	1
15.	a)	Construct the hash table with keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function $h(k) = k \text{ mod } 10$.	5	3	5	2
	b)	Explain Insertion sort with an example and write its time complexity.	3	2	5	1
16.	a)	Convert the given infix expression to postfix and give a detailed representation of stack content while doing the conversion. $A+B*C/D*(F-E)$	5	3	2	2
	b)	Compare Stacks using Arrays and Stacks using Singly Linked List.	3	2	2	1
17.		Answer any <i>two</i> of the following:				
	a)	Explain different operations performed on AVL Trees along with an example.	4	1	3	1
	b)	Compare Prim's and Kruskal's algorithm with an example.	4	2	4	1
	c)	Illustrate with an example how collisions are handled in hashing.	4	2	5	1

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

Proof