Hall Ticket Number:

Code No. : 13657 S N/O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

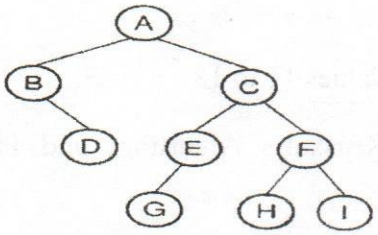
B.E. (I.T.) III-Semester Supplementary Examinations, August-2023

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.	2	1	1	1
2.	Represent Polynomial as an Abstract data type.	2	1	1	1
3.	Compare Queue and Circular Queue.	2	2	2	1
4.	List any two applications of Linked List.	2	1	2	1
5.	Define Heap.	2	1	3	1
6.	Construct Inorder and Post order traversals by traversing the given tree. 	2	2	3	1
7.	Define M-way search trees.	2	1	3	1
8.	Identify which data structure is used to implement Breadth First Search.	2	1	4	1
9.	Define static hashing.	2	1	5	1
10.	What is the best and average case time complexity of Insertion Sort?	2	1	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Explain different Asymptotic notations with example.	3	2	1	1
b)	Write a Function to convert the given infix expression to postfix expression, and give a detailed representation of stack content while doing the conversion. a + b/(c /d + g) /h.	5	3	2	2
12. a)	Compare difference between Stacks using arrays and Stacks using linked list.	3	2	2	1
b)	Write a function to reverse a linked list.	5	3	2	2

Contd... 2

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13. a)	Create a heap(max heap) with following list of keys: 8, 20, 9, 4, 15, 10, 7, 22, 3, 12	3	2	3	1
b)	Write a function to count number of leaf nodes in a Binary tree.	5	3	3	2
14. a)	Construct B-tree of order *5* (maximum *5* child nodes) using following sequence. 23, 11, 4, 89, 119,52, 98,349, 164,450,333, 15, 12, 17.	4	4	3	2
b)	Write a function to implement Depth First Search.	4	3	4	2
15. a)	Write a function to implement Insertion Sort.	4	3	5	2
b)	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 mod 10.	4	2	5	1
16. a)	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
b)	Compare Singly Linked List and Doubly Linked List.	3	2	2	1
17.	Answer any ***two*** of the following:				
a)	Construct an AVL Tree by inserting values 11 to 18.	4	2	3	1
b)	Compare the difference between Kruskal's Algorithm and Prim Algorithm.	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%

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