Hall Ticket Number:

Code No. : 14164 BO

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. IV-Semester Backlog Examinations, July-2023

Data Structures and Algorithms (OE-II)

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.	What is Data abstraction?	2	1	1	1
2.	Define space complexity.	2	1	1	1
3.	List the differences between stack and queue.	2	2	2	1
4.	What is Pattern matching? Give example.	2	1	2	1
5.	Differentiate between linear queue and circular queue.	2	2	3	1
6.	What is a postfix expression? Give example.	2	1	3	1
7.	What is static hashing?	2	1	4	1
8.	Define overflow handling.	2	1	4	1
9.	What is pre-order traversal? Give example.	2	1	5	1,2
10.	What is a binary tree? Give example.	2	1	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Describe the different notations used to describe the asymptotic running time of an algorithm.	5	2	1	1
b)	Explain Sparse matrix with an example.	3	2	1	1,2
12. a)	Describe the functional code for inserting a desired node in doubly linked list.	4	3	2	1,2,3
b)	Explain circular linked list with an example.	4	2	2	1,2
13. a)	Explain the insert and delete operations on a queue with examples.	4	2	3	1,2
b)	Evaluate the following postfix expression 5 7 3 + 4 2 * * 6 + * using stack. Show the content of the stack at each step.	4	3	3	1,2
14. a)	Construct a Heap and sort the following list of elements {12, 89, 11, 78, 21, 96, 45, 16, 47, 45}	4	3	4	1,2
b)	Write the algorithm for quick sort and analyze its performance.	4	2	4	1,2,3

Contd... 2

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15. a)	Construct the binary search tree with the following keys { 28, 26, 57, 85, 21, 45, 87, 58, 12 ,40}	4	3	5	1,2
b)	Construct a binary tree having the following traversal sequences: Preorder traversal: A B C D E F G H I Inorder traversal: B C A E D G H F I	4	3	5	1,2
16. a)	Write an algorithm to compute the sum of first 'n' natural numbers using recursion.	4	3	1	1,2,3
b)	List out the various applications of queues.	4	2	2	1
17.	Answer any ***two*** of the following:				
a)	Convert the following expression from infix to postfix notation A+(B*C-(D/E-F)*G)*H	4	3	3	1,2
b)	Sort the following elements using merge sort. 21, 11, 5, 78, 49, 54, 72, 88	4	3	4	1,2
c)	Explain prim's algorithm with an example.	4	2	5	1,2,3

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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