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Code No. : 15147 S BO

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. V-Semester Supplementary Examinations, June-2023

Principles of Data Structures (OE-III)

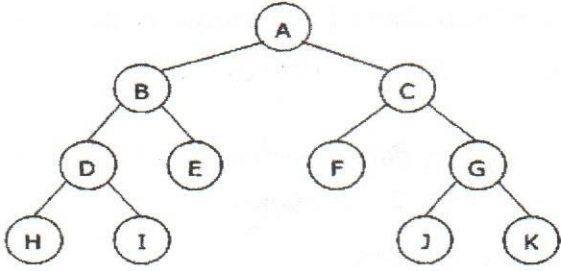
Time: 3 hours

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 a linear data structure? Give example.	2	1	1	1,2
2.	Define Algorithm.	2	1	1	1
3.	How is a linked list represented? Give example.	2	1	2	1,2
4.	List the different types of linked lists.	2	1	2	1
5.	List the applications of stacks.	2	1	3	1
6.	Given the elements b, h, c, f, u inserted into a queue. Represent the front and rear ends of a queue with the help of a diagram.	2	3	3	1,2
7.	Define a binary tree? Give example.	2	1	4	1,2
8.	How do you convert a general tree to binary tree? Give example.	2	2	4	1,2
9.	Sort the following numbers using bubble sort. Show the working 25, 68, 35, 45, 20, 52	2	3	5	1,2
10.	When is binary search performed? Give an example of sequence of elements on which binary search can be performed.	2	2	5	1,2
Part-B (5 × 8 = 40 Marks)					
11. a)	What is the purpose of a data structure? Explain its significance with examples.	3	2	1	1,2
b)	Write the recursive function to compute the factorial of a number.	5	3	1	1,2,3
12. a)	What are the advantages of linked lists over arrays?	3	2	2	1
b)	Given the elements stored in single linked list as shown below. Write the algorithm to insert the element 50 at the end of a single linked list.	5	3	2	1,2,3
<pre> graph LR FIRST((FIRST)) --> Node1[10 1000] Node1 --> Node2[15 2000] Node2 --> Node3[20 NULL] Node3 --> NULL((NULL)) Node1 --- A1[4000] Node2 --- A2[1000] Node3 --- A3[2000] </pre>					
13. a)	What are the different operations performed on a queue? Explain with examples.	4	2	3	1,2
b)	Write a C program to perform PUSH and POP operations on a stack implemented as an array.	4	2	3	1,2,3

14. a)	<p>What do you mean by traversing a tree? Write the preorder traversal, inorder traversal and postorder traversal for the following binary tree.</p> 	5	3	4	1,2,3
b)	<p>Give the different representations of a binary tree. Explain with examples.</p>	3	2	4	1,2
15. a)	<p>What is linear search technique? Explain with the help of an example.</p>	3	2	5	1,2
b)	<p>Sort the following data using Merge Sort. Show the working procedure. 32, 55, 25, 35, 10, 20, 40</p>	5	3	5	1,2
16. a)	<p>How is recursion different from iteration? What are the advantages of recursion?</p>	4	2	1	1
b)	<p>Explain the deletion operation on linked list with examples.</p>	4	2	2	1,2
17.	<p>Answer any <i>two</i> of the following:</p>				
a)	<p>What is a queue data structure? What is the principle on which queue works? List its applications.</p>	4	1	3	1,2
b)	<p>Define a Binary search tree. Construct the Binary search tree with the following data. 56, 24, 12, 78, 35, 62, 35, 15, 30</p>	4	3	4	1,2,3
c)	<p>Write a C program to sort the given elements 15, 20, 2, 25, 10, 5 using selection sort.</p>	4	3	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%
