

Hall Ticket Number:

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Code No. : 13119C

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (CBCS) III-Semester Main Examinations, December-2018

Introduction to Data Structures
 (Open Elective-I)

Time: 3 hours

Max. Marks: 60

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

Q.No.	Stem of the question	M	L	CO	PO
Part-A (10 × 2 = 20 Marks)					
1.	What are the advantages of linked lists over arrays?	2	2	1	1
2.	Write a function to store the 'x' student information in the beginning of a linked list which maintains student's information. (roll no, marks).	2	3	1	2
3.	Write a function to check whether circular queue is full or not.	2	2	2	2
4.	Find the content of a stack after doing following operations push(13) push(25) push(63) push(97) pop() pop() push(20) push(80)	2	2	2	2
5.	Define the Binary search tree and give example.	2	2	3	1
6.	Find the maximum and minimum number of edges of connected graph with 4 vertices and draw the graph for both	2	2	3	1
7.	Define space complexity.	2	2	4	1
8.	Specify the time complexity of the looping structure which prints numbers from 1 to 'n'	2	3	4	2
9.	Write the function to search for an element when array elements are in the sorted order.	2	3	1	2
10.	Find the pre-order traversal of the given tree:	2	3	3	2
<pre> graph TD 10((10)) --- 6((6)) 10 --- 18((18)) 6 --- 4((4)) 6 --- 8((8)) 18 --- 15((15)) 18 --- 21((21)) </pre>					
Part-B (5 × 8 = 40 Marks)					
11. a)	What is sparse matrix? How it can be represented efficiently Give example	4	3	1	1
b)	Write the function to insert the element at the end of the circular linked list.	4	2	1	1
12. a)	What is queue? Write a program to implement insert and delete operation for linear queue.	4	2	2	1
b)	Convert the following expression into postfix expression showing the stack content after each operator read from given expression and output expression. (a+b*c)-(e*f+g)/h+i	4	3	2	2

Contd...

<p>13. a) Show the tree structure after inserting element 65 and deleting an element 30 from the given BST.</p>	<p>4 2 3 1</p>
	<p>.</p>
<p>b) Represent the given graph as adjacency matrix and as adjacency list.</p>	<p>4 3 3 1</p>
<p>14. a) Find the time complexity of the function which finds the factorial of a given number.</p>	<p>4 3 4 1</p>
<p>b) Specify the different Asymptotic notations used for finding the complexity of the algorithms.</p>	<p>4 2 4 1</p>
<p>15. a) Write a function to insert the element 'x' into an array at kth position.</p>	<p>4 2 1 1</p>
<p>b) Write a function to display the alternate element of the linked list which stores the cost of the items.</p>	<p>4 2 1 2</p>
<p>16. a) Construct a BST for the following set of elements. 120 25 400 650 10 150 110 180</p>	<p>4 3 3 2</p>
<p>b) Write an algorithm for BFS traversal and find the BFS traversal for a given graph from the vertex A.</p>	<p>4 3 3 2</p>
<p>17. Answer any <i>two</i> of the following:</p>	
<p>a) Write a function to reverse the linked list.</p>	<p>4 2 1 1</p>
<p>b) Given the in-order and post-order traversals, construct a Binary Tree and write the pre-order traversal for the constructed tree. In-order : A, B C D E F and Post-order : F E D C B A</p>	<p>4 2 3 1</p>
<p>c) Write a function to evaluate the postfix expression using stack operations.</p>	<p>4 2 2 2</p>

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

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60
2	Knowledge on application and analysis (Level-3 & 4)	40
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	---