Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

School Of Computer Science and Engineering & Information Science

Summer term End-Term Examinations, August 2024

Odd Semester: 2023 - 24
Course Code: CSE2006
Course Name: Data Structures
Department: CSE

Date: 5/08/2024
Time: 1:00 pm – 4:00 pm
Max Marks: 100
Weightage: 50%

Instructions:

(i) Read all questions carefully and answer accordingly.
(ii) Do not write anything on the question paper other than the roll number.

Q.No	Questions	Marks	CO	RBT
1	a. What is data structure? Explain various types of data structures in detail.	4	CO1	L1
	b. What is bubble sort? Explain the advantages and disadvantages of bubble sort.	6	CO1	L2
	c. What is selection sort. Explain algorithm of selection sort with an example array.	10	CO1	L3

OR

2	a. List out the areas in which data structures are applied extensively.	4	CO1	L1
	b. Write a c program to extract a substring from the given string.	6	CO1	L2
	c. What do you mean by the complexity of an algorithm? Explain the meaning of worst-case analysis and best-case analysis with an example.	10	CO1	L3

3	a. Write and explain POP operation algorithm of a stack.	4	CO2	L1

	b. Consider size of stack as 5.Apply following operation on stack and show the status of stack and top pointer after each operation . i) push a , b, c ii) pop iii) push e,f iv) pop v) push g h vi)push m vii)pop	6	CO 2	L 2
	c. Convert the following infix expression to postfix using stack (A+B*C)/(D-E)+F	10	CO 2	L 3

OR

4	a. Write the algorithm for converting from infix to post-fix.	4	CO2	L 1
	b. Explain stack data structure and write an algorithm to push and pop an element to and from the stack.	6	CO2	L 2
	c. What are queues? Write down an algorithm for inserting and deleting elements from a queue implemented using arrays.	10	CO2	L 3

5	a. Differentiate between List and array in four points.	4	CO 3	L 1
	b. Define linked list. Explain different types of linked list. Mention the advantage of linked list?	6	CO 3	L 2
	c. What is a linked list? Give the data structure and write algorithms to (i) Delete an element. (ii) Count the number of elements.	10	CO 3	L 3

OR

6	a. Write down the steps to modify a node in linked lists.	4	CO 3	L 1
	b. Write an algorithm to insert a node at the beginning of the list.	6	CO 3	L 2
	c. Explain the insertion operation in linked list. How nodes are inserted after a specified node.	10	CO 3	L 3

7	a. Define: binary tree, complete binary tree, strict binary tree.	4	CO 4	L 1
	b. Construct binary search tree for following data: 6, 8, 33, 3, 40, 2, 9, 10, 22, 15, and 17. Consider 10 as root.	6	CO 4	L 2
	c. Show the result of inserting 3,1,4,6,9,2,5,7 into an initially empty binary search tree. Also write down the result of 3 traversals on this binary search tree.	10	CO 4	L 3

OR

8	a. What is Binary search tree? Write the application areas that use a binary search tree.	4	CO4	L1
	b. Write an algorithm for the following 1) In order tree traversal	6	CO4	L2

	2) Pre order tree traversal 3) Post order tree traversal			
	C. Given the following inorder and preorder traversal reconstruct a binary tree Inorder – D,G,B,E,A,F,I,C Preorder – A,B,D,E,H,C,F,I	10	CO4	L3

9	a. Write a C program to find the factorial of a given number.	4	CO1	L1
	b. Explain the classification of data structure and operations on data structures.	6	CO1	L2
	c. Why do we use asympatotic notation in the study of algorithm? Describe commonly used asymptotic notation and give their significance.	10	CO1	L3

OR

10	a. List two sort methods. Give example of each.	4	CO2	L1
	b. Explain stack data structure and write algorithm to push and pop an element to and from the stack.	6	CO2	L2
	c. What are queues? Write down algorithm for inserting and deleting elements from a queue implemented using arrays.	10	CO2	L3