UPES
UNIVERSITY OF TOMORROW

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Data Structures   **Semester: II**
Program: B.Tech. (Computer Science & Engineering)   **Time : 03 hrs.**
Course Code: CSEG1011   **Max. Marks: 100**

Instructions: Attempt all sections.

SECTION A

1. Each question will carry 4 Marks
2. Instruction: Write short answers (60-70 words)

S. No.		Marks	CO
Q 1	Explain 2 tree with example.	4	CO2
Q 2	Discuss adjacency list representation for a given graph with suitable example?	4	CO1
Q 3	Consider the following arithmetic expression P, written in postfix form : P: 6, 4,3,*,+,15,5,/,-,6,+ Evaluate it	4	CO3
Q 4	Suppose the following sequences list the nodes of a binary tree T in preorder and inorder, respectively: Preorder: GBQACKFPDERH Inorder: QBKCFAGPEDHR Draw the diagram of the tree	4	CO1
Q 5	Insert the following keys into an empty B Tree of order 4 12 ,4, 7, 3, 89, 23, 6, 78, 44, 32	4	CO4

SECTION B

1. Each question will carry 10 marks.
2. Instruction: Write short/brief notes (100-150 words)

Q 6	Implement circular queue using linked list by writing C functions for enqueue, dequeue, and display operations.	10	CO4
Q 7	Explain balanced binary search tree with all type of rotations. Insert the following keys into an empty AVL tree 41, 29, 2, 34, 11, 6, 18, 72, 49, 36	10	CO2
Q 8	Discuss minimum spanning trees of a graph. Write an algorithm to find minimum cost spanning tree using Kruskal's method. OR	10	CO3

	Write C function for Selection sort and apply it to find non decreasing order of given list 34,2,67,89,24,54,11,28,-4,54,81,7,76,90,12		
Q 9	Implement doubly linked list for following C functions (i) Insertion at beginning (ii) Deletion from end (iii) Display	**10**	**CO2**

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SECTION-C

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1. Each question carries 20 Marks.
2. Instruction: Write long answer. (Up to 350 words while explaining)

Q 10	Explain the following: (i) Polish notations (ii) Input restricted dequeuer (iii) Circular doubly linked list (iv) Huffman Coding for data compression	**20**	**CO1**
Q 11	Write C function for binary search. Compare linear search with Binary search. Trace all steps to search the key 100 in the following list using binary search 9, 21,38,49,67,72,83,85, 91, 99, 100,110,121	**20**	**CO4**