Register Number:……..

KUMARAGURU college of technology
character is life

ENTER **B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2022**

(Regulation 2018)

Third Semester

INFORMATION TECHNOLOGY

U18ITI3202T:DATA STRUCTURES

COURSE OUTCOMES

CO1: Explain various sorting algorithms.
CO2: Explain various searching algorithms.
CO3: Explain the concepts of List, Stack and queue
CO4: Explain the concepts of trees and graphs
CO5: Implement the given problem using Linear and Non-Linear Data Structures

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	What is collision? Explain Separate chaining	CO2	[K_2]
2.	Explain the working of Polyphase Merge Technique	CO1	[K_2]
3.	Explain the Heap order property of Binary heap	CO3	[K_2]
4.	Explain the graph representation Techniques.	CO4	[K_2]
5.	Write in detail about Threaded Binary trees	CO3	[K_2]
6.	Differentiate Depth first Traversal and Breadth first Traversal.	CO4	[K_2]
7.	Illustrate how stack can be used to convert the given infix expression to postfix expression. (a+b*c)+(d*e-f/g)*(h+h)	CO5	[K_2]
8.	Write a routine to display the elements of list implemented using arrays.	CO5	[K_3]
9.	The inorder and preorder traversal of a binary tree are d b e a f c g and a b d e c f g, respectively. Construct a binary tree and do the postorder Traversal	CO5	[K_3]
10.	Explain the concept of Kruskal's Algorithm.	CO5	[K_3]

Answer any FIVE Questions
PART B (5 x 4 = 20 Marks)
(Answer not more than 80 words)

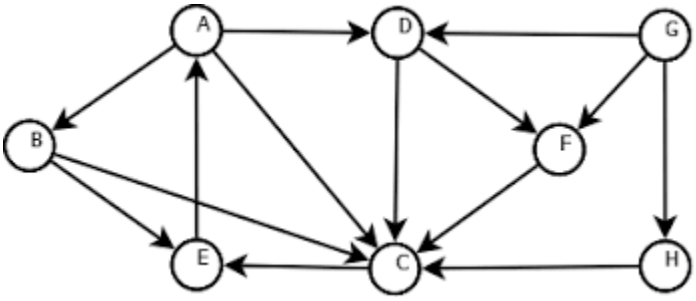
11.	Write a routine to sort the elements using Selection sort algorithm.	CO1	[K_2]
12.	Write a function to search the element 'k' in the array 'a'using binary search algorithm.	CO2	[K_2]

13. Write a routine to display the elements of the doubly linked list in the reverse order. CO4 [K3]

14. Explain the enqueue operation of Linked Queue. CO3 [K2]

15. Construct an AVL tree for given key values by inserting their elements successively starting with the empty tree 3, 6,5,1,2,4,7,8,12, CO5 [K3]

16. Explain the depth first search graph traversal algorithm and apply it to the given graph by considering the starting vertex as "A". CO5 [K3]



Answer any FIVE Questions
PART C (5 x 12 = 60 Marks)
(Answer not more than 300 words)

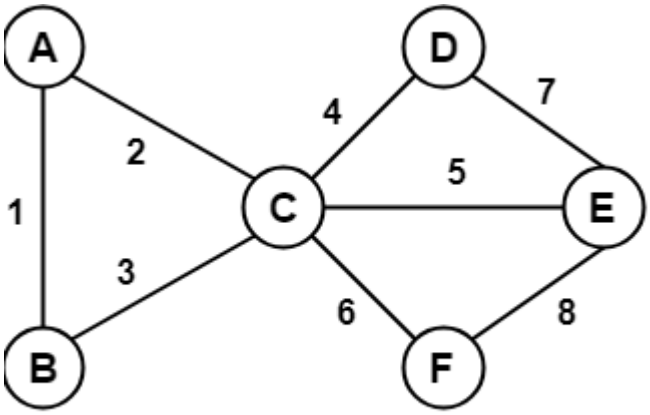
17. a) Write necessary routines and explain the quick sort algorithm with an example. 12 CO1 [K2]

18. a) Write and explain the algorithm to convert the infix expression to postfix expression with an appropriate example. 12 CO5 [K3]

19. a) Write a routine to perform set union operation using Linked list. 6 CO5 [K3]
    b) Explain the dequeue operation of the circular queue implemented using arrays 6 CO3 [K2]

20. a) Construct a Min heap with 14,6,5,8,15,3,9,7,4,11,13 and perform two deletemin operations. Show both the tree and array representation of the heap 6 CO4 [K3]
    b) Write and explain the insert routines of Binary Search trees 6 CO4 [K3]

21. a) Explain Prim's Algorithm to construct a Minimum spanning tree 6 CO4 [K2]
    b) For the given graph, show the stepwise construction of the Minimum spanning tree using Prim's algorithm. 6 CO5 [K3]



22.	a)	Construct an expression tree for the expression and explain how it is constructed using the stack A * B - (C + D) * (P / Q) and perform the tree traversals	6	CO4	[K_3]
	b)	Write the routine to display the elements of the circular Linked list.	6	CO3	[K_2]

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