Vivekanand Education Society's Institute of Technology
Department of Computer Engineering
Academic Year 2024-25

Name of the Course: **Design and Analysis of Algorithms NCMPCL41**
Year/Sem/Class: **S.E.(Comp)- IV sem-D7A/B/C**
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Assignment - I

Date of Preparation :28th Feb. 2025 **Date of Submission : 10th Mar. 2025**

No	Questions	LO
1	A) Explain Master's Method. Solve the following recurrence relations using master"s method $T(n) = 8T(\frac{n}{2}) + \Theta(n^2)$ n > 1 =1 , n = 1 B) Explain recursion tree method with proper example.	1,2,3,4
2	What do you understand about the time and space Complexity of algorithms? Write the insertion sort algo and analyse the time and space complexity of algo?	1,2,3,4
3	If the algorithm **do_This(...)** has the complexity of 1, calculate the run-time complexity of the following program segment? **j = i = 1** **loop i <= N** **loop j <= i^2** **do_This(...)** **j = j + 1** **i = i + 1**	1,2,3,4
4	Write the recurrence relation of merge and quick and solve it by substitution method..	1,2,3,4

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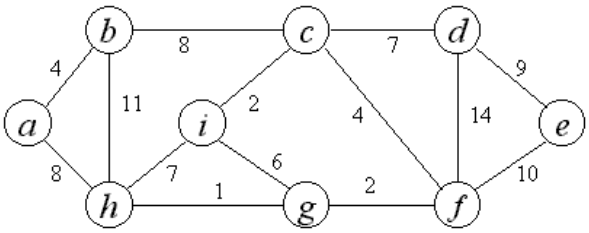
5	Write an algorithm for binary search ,write and solve recurrence relation for the same and apply binary search in following list to find out 3: 3,9,8,12,16,18,20	1,2,3,4
6	Find out Minimum Spanning Tree using Prim's algorithm and Kruskal's Algorithm. Show the intermediate trees as well during the process. 	1,2,3,4
7	Apply selection and quick sort on following input sequence 23,2, 21, 6, 7 24, 8,5,3, 2,14	1,2,3,4
8	Explain fractional Knapsack problem with proper examples.	1,2,3,4
9	Write the algorithm for job sequencing with deadlines. Also find an optimal schedule for following jobs where profit and deadlines are given. p=(20,55,35,90,64) d=(4,2,2,3,1) Calculate the minimum penalty and maximum profit for the same	1,2,3,4