

Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India (Autonomous College Affiliated to University of Mumbai)

RE-Examination

Jan 2019

Max. Marks: 100

Class: S.E.

Course Code: IT41 / CE41

Name of the Course: Design And Analysis of Algorithm

Duration: 3 Hrs Semester: IV

Branch: IT/COMP

Instructions:

(1) All Questions are Compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

			Question				СО
Write a short note on Asymptotic Notations.						05	CO
Write an Insertion Sort algorithm and analyze the Best Case and Worst Case time complexity.					05	CO1	
Derive the best and worst case time complexity of Quick Sort algorithm and Sort the following elements using Quick Sort Algorithm. Show the steps of each passes. 85, 36, 87, 10, 91, 18, 15, 52 OR Write an algorithm using Divide and conquer approach for finding minimum and maximum number form a given set. Simulate the above algorithm to find Min and Max on the following elements. Show the tree of recursive calls 22 13 -5 -8 15 60 17 31 47					10	CO2	
alli of Hommios	perow gr	nming apportuning	proach 0/1 I ack instance 3 4	Cnapsack, Fire where n=5	and the optimal and capacity of 5	10	CO3
	Write an Insettime complex Derive the besort the followeach passes. 8 Write an algorithm to firecursive calls 22 13 Using Dynamic solution to the the knapsack= Item No.	Write an Insertion Sort time complexity. Derive the best and we Sort the following eler each passes. 85, 36, 87 Write an algorithm minimum and maximalgorithm to find Min arecursive calls 22 13 -5 -8 Using Dynamic Programs solution to the below girthe knapsack=10 Item No. 1	Write an Insertion Sort algorithm time complexity. Derive the best and worst case time Sort the following elements using each passes. 85, 36, 87, 10, 91, 18. Write an algorithm using Diversity minimum and maximum number algorithm to find Min and Max of recursive calls 22 13 -5 -8 15 60 Using Dynamic Programming appropriate to the below given knapsache knapsack=10 Item No. 1 2	Write a short note on Asymptotic Notations Write an Insertion Sort algorithm and analyze time complexity. Derive the best and worst case time complex Sort the following elements using Quick Sort each passes. 85, 36, 87, 10, 91, 18, 15, 52 OR Write an algorithm using Divide and cominimum and maximum number form a salgorithm to find Min and Max on the follow recursive calls 22 13 -5 -8 15 60 17 31 47 Using Dynamic Programming approach 0/1 Hosolution to the below given knapsack instance the knapsack=10 Item No. 1 2 3	Write a short note on Asymptotic Notations. Write an Insertion Sort algorithm and analyze the Best Cotime complexity. Derive the best and worst case time complexity of Quick Sort the following elements using Quick Sort Algorithm. each passes. 85, 36, 87, 10, 91, 18, 15, 52 OR Write an algorithm using Divide and conquer approximinimum and maximum number form a given set. Stalgorithm to find Min and Max on the following elements recursive calls 22 13 -5 -8 15 60 17 31 47 Using Dynamic Programming approach 0/1 Knapsack, Fit solution to the below given knapsack instance where n=5 the knapsack=10 Item No. 1 2 3 4	Write an Insertion Sort algorithm and analyze the Best Case and Worst Case time complexity. Derive the best and worst case time complexity of Quick Sort algorithm and Sort the following elements using Quick Sort Algorithm. Show the steps of each passes. 85, 36, 87, 10, 91, 18, 15, 52 OR Write an algorithm using Divide and conquer approach for finding minimum and maximum number form a given set. Simulate the above algorithm to find Min and Max on the following elements. Show the tree of recursive calls 22 13 -5 -8 15 60 17 31 47 Using Dynamic Programming approach 0/1 Knapsack, Find the optimal solution to the below given knapsack instance where n=5 and capacity of the knapsack=10	Write a short note on Asymptotic Notations. Write an Insertion Sort algorithm and analyze the Best Case and Worst Case time complexity. Derive the best and worst case time complexity of Quick Sort algorithm and Sort the following elements using Quick Sort Algorithm. Show the steps of each passes. 85, 36, 87, 10, 91, 18, 15, 52 OR Write an algorithm using Divide and conquer approach for finding minimum and maximum number form a given set. Simulate the above algorithm to find Min and Max on the following elements. Show the tree of recursive calls 22 13 -5 -8 15 60 17 31 47 Using Dynamic Programming approach 0/1 Knapsack, Find the optimal solution to the below given knapsack instance where n=5 and capacity of the knapsack=10 Item No. 1 2 3 4 5



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Q2. b)	Write Kruskal's algorithm and for the following graph find minimum spanning tree using Kruskal's Algorithm. 20 20 3 5 4 50 5 30 15 25	10	CO4
Q.3 a)	Explain LCS using Dynamic Programming Approach. Find LCS using Dynamic Programming Approach of the following two strings: Y="ABBCCDB" X="ABCDBCA"	10	COS
Q.3 b)	Compare Backtracking and Branch and Bound. Explain Graph coloring problem using Backtracking Approach with the help of State Space Tree. OR Explain how Traveling Salesperson problem can be solved using Branch and Bound with the help of State Space Tree.	10	CO5
Q.4 a)	Write a backtracking algorithm for sum of subset problem. Draw portion of state space tree that is generated to find all possible subsets of w that sum to m using above algorithm for the given problem: n=7, w= {5, 7, 10, 12, 15, 18, 20}, m=35	10	CO5
Q4 b)	Write a KMP-Prefix Function algorithm and Compute the prefix function for the given pattern i) cocacola ii) bababba OR Consider working module q=11, how many spurious hits does the Rabin-Karp Matcher counter in the text $T=31415926535$ when looking for the pattern $P=26$. Show each step of solution.	10	CO5



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Q.5a)	Make use of greedy approach to find the shortest distance from node A to F where node A is a source node	10	CO4
Q.5. b)	Solve the following linear program using SIMPLEX: maximize $z=12x_1+16x_2$ subject to $10x_1+20x_2\leq 120$ $8x_1+8x_2\leq 80$ $x_1 \text{ and } x_2\geq 0$ OR Explain how to convert Linear Problem into the following form; i) Standard and Slack form ii) Dual Form. Show above mentioned conversion (i and ii) with an example.	10	CO6