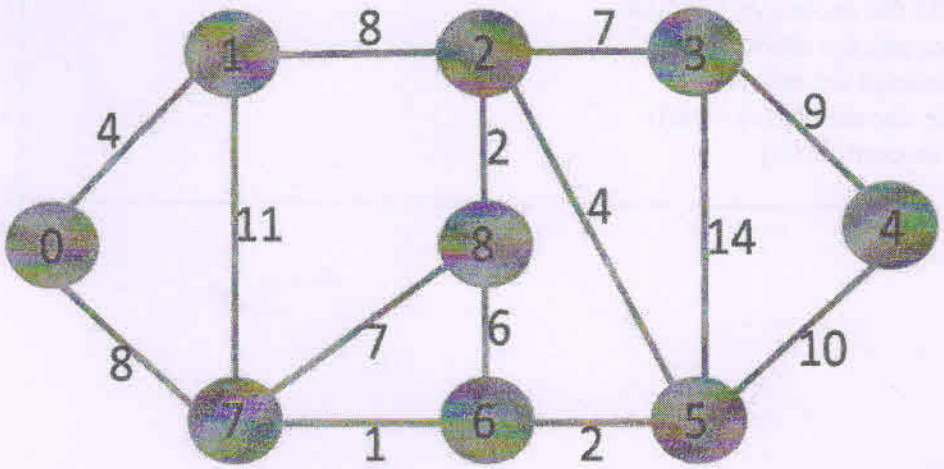
06/05/17 (E)

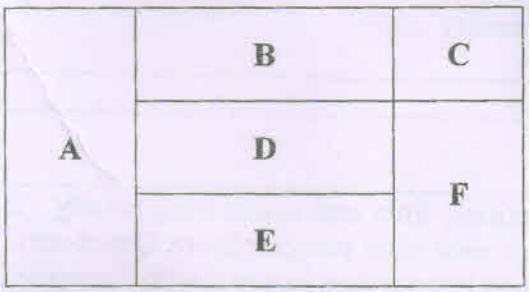
K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

End Semester Examinations
April - May 2017

Max. Marks:100 **Duration: 3 hr**
Class: S.Y.Btech Semester: IV
Name of the Course: Analysis of Algorithm Branch: Computer
Course Code: UCEC403

Instructions:
(1) All Questions are Compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Question No.		Marks
Q 1 (a)	Define asymptotic notations, time and space complexcity . Explain the Worst case and Average case time complexity of Quick sort algorithm with the help of Recursion tree method in detail with Example .	10
Q 1 (b)	i) Solve the recurrence relation T(n)=2T(N/2)+2 using recurrence tree method ii) Sort the following numbers using Merge sort .Give the output of each pass 28,45, 12, 9, 54, 87, 32, 1, 56	10
Q2 (a)	Explain the concept of Optimal storage on tapes with an example. Compute all feasible solutions and prove how the greedy strategy gives optimal solution for the problem. **OR** Explain the concept of Job sequencing with deadlines with an example. Compute all feasible solutions and prove how the greedy strategy gives optimal solution for the problem.	10
Q2 (b)	Define Minimum Spanning Tree. Compute MSTs using Kruskal's and Prim's algorithm 	10

Q3 (a)	Explain how the dynamic strategy helps in minimizing total number of computations in matrix chain multiplication. Solve the given instance to help in deciding over the sequence of matrix chain multiplication. N = 4 with P0 = 6, P1 = 4, P2 = 2, P3 = 4 & P4 = 5 . Find m[1,4]. **OR** For the given graph, compute the minimum chromatic number to color the graph such that no two adjacent vertices have the same color. Give all possible combinations of such color assignments using backtracking. Draw state space tree and backtracking tree both. 	10
Q3 (b)	Explain the problem of optimal binary search tree. Solve the given instance of OBST to generate the solution tree. Also compute cost of the tree. N = 4 , (a1, a2, a3, a4) = (do, if, int, while). Also, p(1:4) = (3, 3, 1, 1) and q(0:4) = (2, 3, 1, 1, 1).	10
Q4 (a)	Define N-Queen's problem. Explain need of backtracking concept by using state space tree and backtracking tree for 4-Queen's problem. Give all the solutions. **OR** Solve the given problem instance of Multistage graphs with forward or backward (either of the methods) -Define the Problem -Define optimal substructure -Write the recursive formula -Compute the answer -Construct the answer -State the answer(s) clearly -Write complexity	10

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	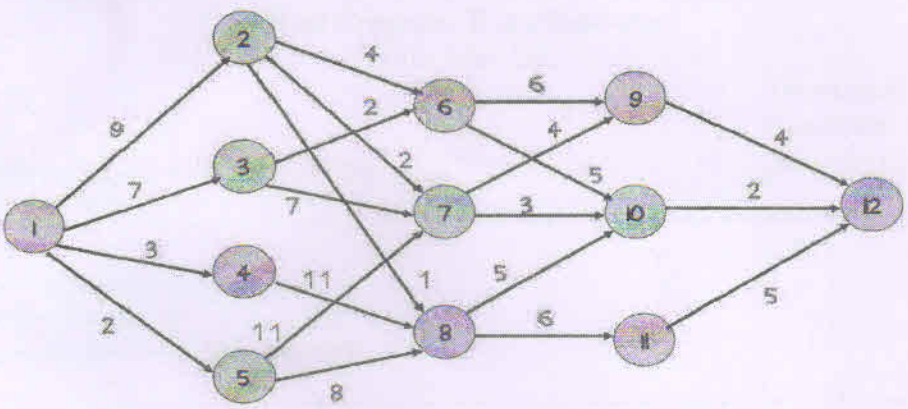	
Q4 (b)	Solve the given problem of sum of subsets using backtracking. Give explicit, implicit and backtracking conditions for the same. N=4, M=31 Values= {11,24,7,13,31}	10
Q5 (a)	Differentiate between substring and subsequence. Solve the following string matching problem using Longest common subsequence problem. X= notebook Y= facebook Compute length of LCS and also give LCS.	10
Q5 (b)	Explain string matching with finite automata with an example. **OR** Explain the concept of Naïve string matching algorithm with an example	10