Sardar Patel Institute of Technology

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

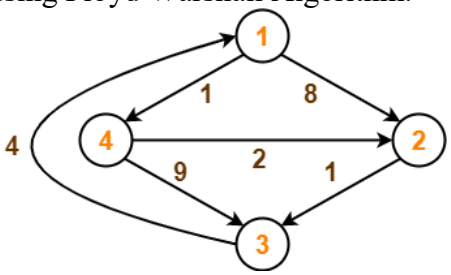
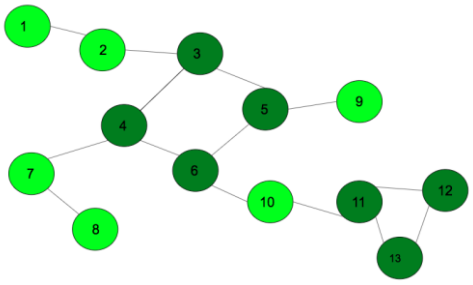
End Semester Examination

May 2021

Max. Marks: 60 Duration: 2.00 hrs
Class: S.Y.MCA Semester: IV
Course Code:MCA43 Branch: M.C.A.
Name of the Course: Design and Analysis of Algorithms

Instruction:
(1) All questions are compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Q. No.	Questions	Max. Marks	CO-BL-PI
Q2		**15**	
A	Write the algorithm for quick sort and analyze its time complexity.	5	2-4-2.2.3 1-4-2.2.3
B	Multiply the matrices A and B using Strassens's Matrix Multiplication. **A**= $\begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}$ **B** = $\begin{bmatrix} 5 & 6 \\ 7 & 3 \end{bmatrix}$	5	2-4-2.2.3
C	The knapsack can hold 60 pounds find the optimal solution using Greedy Method Items: Item1 (5 pounds, 30$), Item2 (10 pounds, 20$), Item3 (20 pounds, 100$), Item4 (30 pounds, 90$), Item5 (40 pounds, 160$)	5	3-2-4.3.4
Q3		**15**	
A	Let the dimensions of A,B,C,D respectively be 10X5, 5X15, 15X8, 8X20 generate matrix product chains that produces minimum number of matrix multiplications using dynamic programming.	8	3-4-2.2.4
B	Draw the portion of state space tree generated by recursive backtracking algorithm for sum of subsets problem with an example. **OR** Explain the importance of bounding function in generating the solutions. And also write about different types of bounding	7	4-4-4.3.4

	functions with an example each.		
Q4		**15**	
A	Find the shortest path distance between every pair of vertices using Floyd Warshall Algorithm. 	5	5-4-4.3.3
B	Analyse the string matching algorithm with finite auotomata, compare with brute force string matching.	5	5-5-4.3.3
C	Do you think set cover problem belongs to NP-Complete class? Give the proof to justify your answer. **OR** Find the vertex cover of the given graph. 	5	6-4-1.3.1