Sanjay Ghodawat University, Kolhapur

2020-21

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EXM/P/09/00

Year and Program: 2020-21 B. Tech. Computer Science & Engg.	**School of Technology**	**Department: Computer Science & Engg.**
Course Code:CST301	**Course Title:Design andAnalysis of Algorithms**	**Semester : V**
Day : Monday **Date : 14.12.2020**	**End Semester Examination**	**Time : 2Hrs.** **11 am to 1 pm.** **Max Marks : 50**

Question Paper

Instructions: 1) All Questions arecompulsory.
2) Draw neat diagrams wherever necessary.

		Marks	Bloom's Level	CO
Q.1	**Answer the following (Any two)**			
a)	Discuss the strategy applied by Strassen to reduce time complexity of matrix multiplication.	8	L3	CO2
b)	The recurrence relation of a recursive algorithm is given as, T(n) = 2 if n = 0 T(n) = T(n-1) + 2if n > 0 Find the formula for time complexity.Using the formula, plot graph of n on x-axis and Time on Y axis for values of n = 0,10,100,1000.	8	L4	CO2
c)	Use Dijkstra's algorithm to find shortest path from node s to all remaining nodes given in Fig. 1 below.	8	L3	CO1

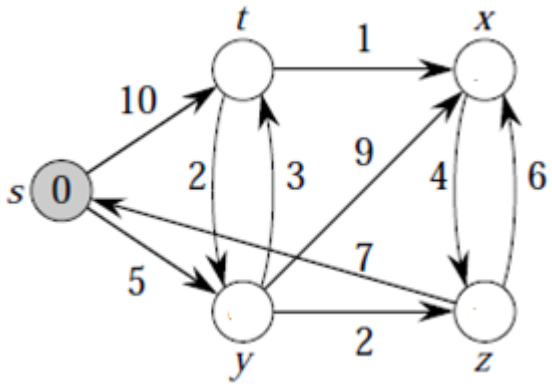


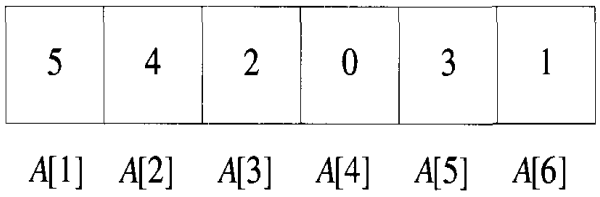
Fig. 1

Q.2 **Answer the following (Any two)**

a)	Design a three stage system with device types D1, D2 and D3. The costs are \$30, \$15 and \$20 respectively. The Cost of the system is to be no more than \$105. The reliability of each device is 0.9, 0.8 and 0.5 respectively.	8	L3	CO1
b)	Write the sum of subsets algorithm and explain its working for w[1:6] = {5,10,12,13,15,18}, n = 6, m = 30.	8	L3	CO3
c)	Describe how to solve following instance of 0/1 knapsack using LC branch and bound technique. N=4, m = 15, (p1,p2,p3,p4) = (10,10,12,18), (w1,w2,w3,w4) = (2,4,6,9). Draw the processing tree.	8	L2	CO3

Q.3 **Answer the following (Any two)**

a)	Illustrate working of Rabin Karp algorithm for Text T="23590231415267399" and pattern P = "31415". Check if there are any spurious hits.	9	L4	CO1
b)	What is AND/OR graph? Prove that AND/OR graph decision problem is NP-Hard.	9	L4	CO4
c)	Explain lisk ranking on PRAM on following input.	9	L3	CO4



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