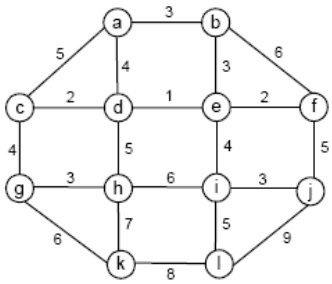
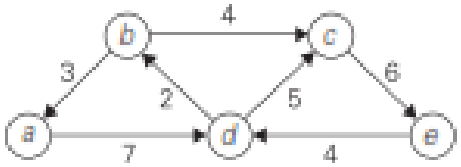
SSN COLLEGE OF ENGINEERING, KALAVAKKAM – 603 110
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
B.E. Computer Science and Engineering
CS6402 Design and Analysis of Algorithms

Date: 15.03.2017, 8.00-9.30 AM **UNIT TEST – 3** **Max. Marks: 50**
Academic Year: 2016-2017 Even **Batch: 2015-2019**
Semester: 4 **Faculty: Dr. R. S. Milton / Mr. V. Balasubramanian**

Qn. No	Part – A (5 * 2 = 10)	Marks	(KL,COn)
1	Maximize 3a + 2b + c Subject to, 2a+b+c ≤ 3, a+b+c ≤ 4, 3a+3b+6c ≤ 6, a,b,c ≥0.	2	K5,CO5
2	Define the basic principle of Back tracking.	2	K1,CO1
3	Using backtracking technique, solve the following instance of the subset sum problem on S = {1,3,4,5} and d =11.	2	K4,CO4
4	What is MST? Give an example.	2	K2,CO2
5	What is the advantage of set representation in Kruskal's algorithm?	2	K4,CO3
	Part – B Answer any four questions (4 * 10 = 40)		
6	Maximise p =2x + 3y + z Subject to: x + y + z ≤ 40 2x + y –z ≥ 10 -y + z ≥ 10, x,y,z ≥ 0	10	K4,CO4
7	Discuss the design steps in Kruskal's algorithm to construct MST. 	10	K4,CO3
8	Explain Dijkstra's algorithm and apply for the graph shown below with source node a. 	10	K4,CO3
9	Use Simplex method to solve the farmers problem given below: A farmer has a 320 acre farm on which she plants two crops: rice and wheat. For each acre of rice planted, her expenses are Rs.50	10	K5,CO5

and for each acre of wheat planted, her expenses are Rs.100. Each acre of rice requires 100 quintals of storage and yields a profit of Rs.60. Each acre of wheat requires 40 quintals of storage and yields a profit of Rs.90. If the total amount of storage space available is 19,200 quintals and the farmer has only Rs.20,000 on hand, how many acres of each crop should she plant in order to maximize her profit? What will her profit be if she follows this strategy?

10 A potter is making cups and plates. It takes her 6 minutes to make a cup and 3 minutes to make a plate. Each cup uses ¾ gms of clay and each plate uses 1 gm of clay. She has 20 hours available for making the cups and plates and has 250 gms of clay in hand. She makes a profit of Rs.2 on each cup and Rs. 1.5 on each plate. How many cups and plates should she make in order to maximize profit. K5,CO5

11 Construct a Huffman tree for the following data and obtain its Huffman code. K3,CO3

Character	A	B	C	D	E
Probability	0.1	0.1	0.2	0.2	0.4

and encode the text DADBE

12 Using Optimal Binary Search Tree (OBST) algorithm compute wi, rij, cij. For three nodes A<B<C with probability A(0.3), B(0.3), C(0.4). K4,CO4

************B E S T O F L U C K************

Prepared by	

Reviewed by HoD, CSE