SSN COLLEGE OF ENGINEERING, KALAVAKKAM

Department of Computer Science and Engineering

B.E. (CSE) IV semester UNIT TEST - 3

CS6402 - Design and Analysis of Algorithms

Date: 1.04.2016 **Staff: Mr. V. Balasubramanian**

Time: 08.00 - 09:30 a.m. **Max. Marks: 50**

Answer All Questions Part – B (5 X 2 = 10)

1. Define Network flow and cut.
2 Maximize 3a + 2b + c

Subject to, $2a+b+c \leq 3$, $a+b+c \leq 4$, $3a+3b+6c \leq 6$, $a,b,c \geq 0$.

3. Define Hamiltonian Circuit problem.
4. Using backtracking terchnique, solve the following instance of the subset sum problem on S = {1,3,4,5} and d =11.
5. Define MST.

Answer any Three questions [2 * 16 = 32 + 1 * 8 =8]

6. Discuss the design steps in kruskal algorithm to construct MST. [8 marks]

(OR)

7. Explain 8-Queen's problem algorithm in detail and solve it. [8 marks]

8. 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 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 inorder to maximize her profit? What will her profit be if she follows this strategy? [16 marks]

[OR]

9. a.The binary string below is the title of a song encoded using Huffman codes.

00110001011111011001110111011000001001110100101 01.

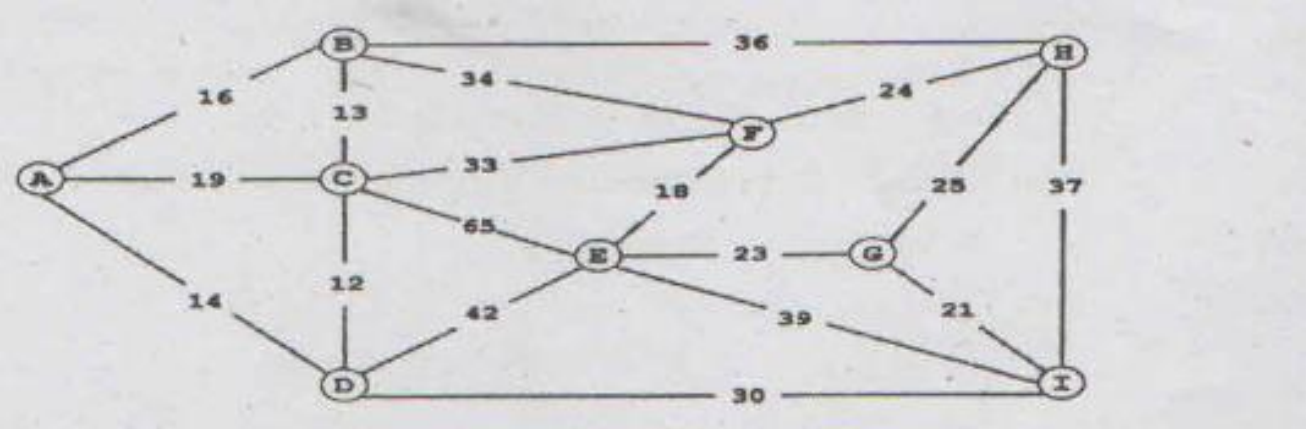
Given the letter frequencies listed in the table below, build the Huffman codes and use them to decode the title. In cases where there are multiple "greedy" choices, the codes are assembled by combiningthe first letters (or groups of letters) fromleft to right, in the order given in the table. Also, the codes are assigned by labelling the left and right branches of the prefix/codetree with '0' and '1', respectively. [10 marks]

Letter	a	h	v	w	‘’	e	t	L	O
Frequency	1	1	1	1	2	2	2	3	3

b. Write the procedure to compute Huffman code. [6 marks]

10. a. Write and analyze the Prim's Algorithm. [6 marks]

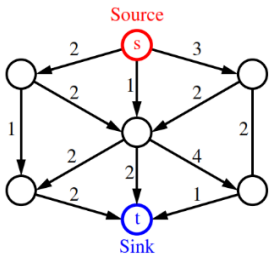
b. Consider the followingweighted graph. Construct MST with start node a.[10 marks]



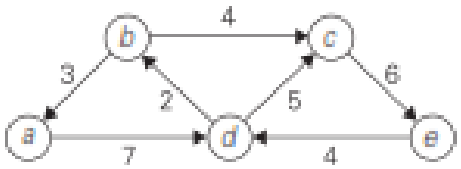
[OR]

11. a. Explain Ford Fulkerson algorithm in detail. Compute the maximum flow for th given graph. [8 marks]

b. Explain Dijkstras algorithm and appy for the graph shown below with source node a. [8 marks]



Q.No 11.a



Q.No 11.b

Prepared by Reviewed by

Mr. V. Balasubramanian HoD / CSE