Computer Science & Engineering (CBCS And Old Pattern) M.Tech. Second Semester Old+CBCS (C.B.S. Pattern)

PCSS21 - Advances in Algorithms

P. Pages : 1 **GUG/W/18/10992**

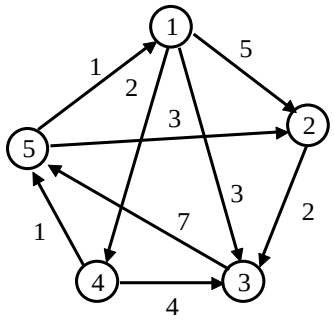
Time : Three Hours * 3 1 1 7 * Max. Marks : 70

Notes : 1. Attempt **any five** questions.
2. All questions carry equal marks.

1. What is dynamic programming? Discuss elements of dynamic programming. Write an algorithm to find longest common subsequences and then determine an LCS of **14**
x = < a, a, b, a, b> and y = <b, a, b, b>

2. Write Algorithm for Huffman code. and it's complexity. What is the optimal code for the following set of frequencies based on first 8 Fibonacci numbers? **14**
a :1, b : 1, c : 2, d : 3, e : 5, f : 8, g : 13, h : 21

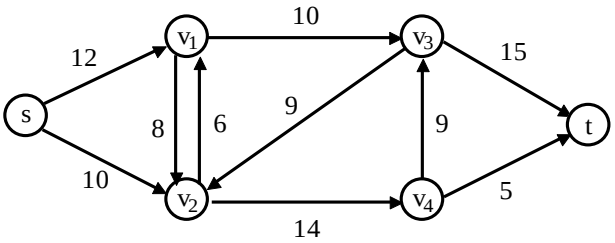
3. Write algorithm for all pair -shortest path (Floyd Warshall), obtain associated matrices for the given directed graph. **14**



4. How dynamic programming differ from greedy. Find an optimal Parenthesization of a matrix chain product whose sequence of dimension are (5, 10, 3, 12, 5, 50, 6) **14**

5. Describe Strassen's algorithm for matrix multiplication use Strassen's algorithm to compute the matrix product. $\begin{bmatrix} 1 & 4 \\ 6 & 8 \end{bmatrix} \begin{bmatrix} 7 & 3 \\ 9 & 5 \end{bmatrix}$ **14**

6. Implement ford-Fulkerson algorithm on the following graph. Also write the algorithm. **14**



7. Construct the string matching automata for the pattern P = < a a b a b > and illustrate its operation on the text string T = < a a a b a b a ab a a b a a> **14**

8. Define how knapsack problem is solved by using dynamic programming approach? **14**
Consider $n = 3, (w_1, w_2, w_3) = (2,3,3) (p_1, p_2, p_3) = (1,2,4)$ and $m = 6$
Find optimal solution for the given data?

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