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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

August 2024 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Computer Science And Engineering **Duration: 3 hrs.**
Course Code: 20CS5PEAAG **Max Marks: 100**
Course: Advanced Algorithms

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

UNIT - I

1 a) Design a Dynamic programming based algorithm to find the order in which matrices are to be multiplied to minimize the number of multiplications. Also, apply the same to solve below instance. **12**

A1 *A2*A3*A4*A5
A1=6*4, A2=4*6, A3=6*5, A4=5*4, A5=4*8

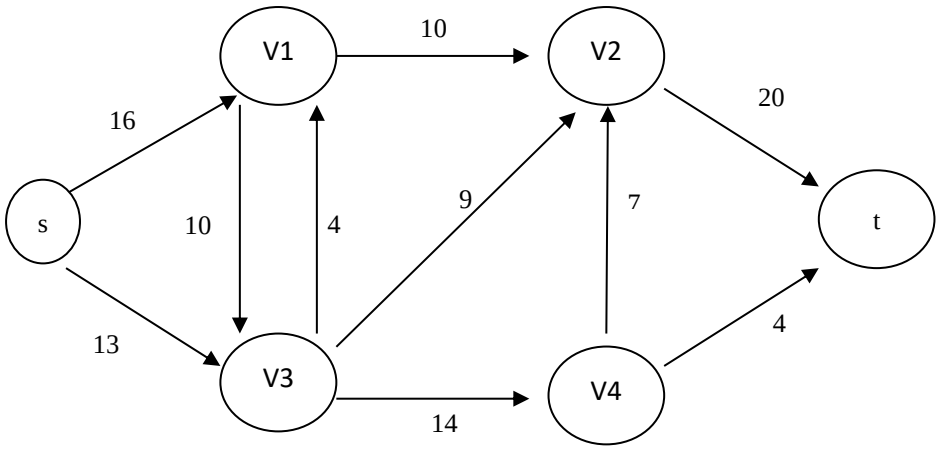
b) Apply Dynamic programming based algorithm to find the longest increasing subsequence in the below list: **8**
2,4,3,8,6,5,9,11,7

UNIT - II

2 a) Design an algorithm for multithreaded matrix multiplication. Also, derive the time complexity for running on a system having **12**

i. One processor
ii. Unlimited processors
iii. Speed up on unlimited processors

b) Apply Ford-Fulkerson method to find maximum flow in the below graph. **8**



OR

3 a) Design an algorithm for merging two sorted arrays that uses multithreading. **12**

b) Design a multithreaded algorithm to find nth Fibonacci number. Also find WORK and SPAN for n=4. **8**

UNIT - III

4 a) Design an algorithm for string matching that uses finite automata. Also apply the same to find P=”babcb “ in T=”abababbabcb “. **12**

b) Write pseudo code/program for Rabin Karp string matching. **8**

OR

5 a) Write and explain Horspool’s string matching algorithm. Also apply the same to find P="abca" in T="abababaabcab". **12**

b) Apply Boyer Moore algorithm to find P="bababb" in T="abbabababababababb". **8**

UNIT - IV

6 a) Apply simplex algorithm to solve the below LPP. **12**

Maximize: $z=4x_1+ 6x_2$
Subject to :
$-x_1+x_2<=11$
$x_1+x_2< =27$
$2x_1+5x_2<=90,$
$x_1,x_2>=0.$

b) Convert the below LPP into standard form. **8**

Minimize: x_1-x_2
Subject to:
$x_1+x_2 <=5$
$x_1-x_2 >13$

UNIT - V

7 a) Design an algorithm to check whether two line segments intersect or not. Apply the same to check whether the line segment (p1,p2) intersects with (p3,p4). **12**

p1=(10,10), p2=(30,30), p3=(10,20), p4=(20,10)

b) Design pseudocode for Graham Scan algorithm. **8**

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