U.S.N.										

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

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 20CS5PEAAG **Max Marks: 100**
Course: Advanced Algorithms **Date: 09.03.2023**

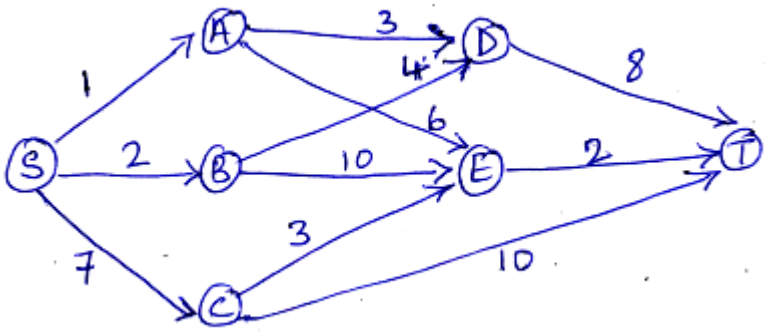
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1 a) Design an algorithm to find the Longest common subsequence. Apply the same and find the solution for the input: **10**
S1:EZUpkr S2:Ubmrapg

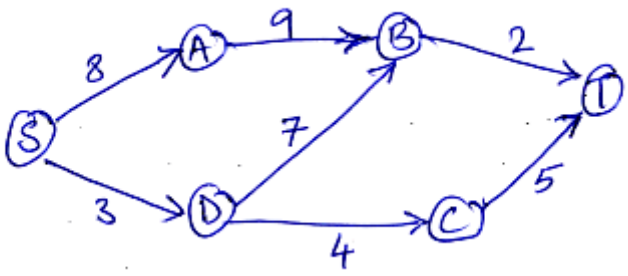
b) Design an algorithm to find the shortest path in a multistage graph and apply the same to find the shortest path for the multistage graph given below: **10**



UNIT - II

2 a) Define Flow network and explain its properties. **05**

b) Design an algorithm for Ford-Fulkerson method and apply the same for the following graph to find the Max-flow: **07**



	c)	What is Maximum Bipartite matching? With an example, explain the method to find maximum flow in a bipartite graph, analyze its time efficiency.	**08**

OR

3	a)	Apply the concept of Multithreading to perform Matrix multiplication. Write the algorithm and analyze its time efficiency.	**8**
	b)	Design a Multithreaded Merge sort algorithm with an example.	**12**

UNIT - III

4	a)	Write Boyer-Moore algorithm for String matching problem. Illustrate it on the following input Text: BESS_KNEW_ABOUT_BAOBABS Pattern: BAOBAB	**08**
	b)	Working module q=19, demonstrate Robin-Karp string matching algorithm for the text: 2339023141526739921 and the pattern :31415.	**08**
	c)	Explain working of Naïve string-matching algorithm.	**04**

OR

5	a)	Design an algorithm for String matching using Finite Automata. Construct finite automata for matching the pattern = abb and for text T=ababbaababba.	**10**
	b)	Discuss Horspool string matching algorithm with an example. Write the algorithm and analyze its best, worst and average case efficiencies.	**10**

UNIT - IV

6	a)	Convert the following linear program into Slack form Maximize: 2X1-6X3 Subject to: X1+X2-X3<=7 3X1-X2 >=8 -X1+2X2+2X3>=0 X1,X2,X3>=0 What are the basic and non-basic variables?	**07**
	b)	List and explain the applications of Linear programming.	**03**
	c)	Solve the following Linear program using the simplex algorithm. Maximize Z=2A+4B+3C Subject to 3A+4B+2C<=60 2A+B+2C<=40 A+3B+2C<=80 A, B, C>=0	**10**

UNIT - V

7	a)	Discuss the two strategies for finding the Convex hull.	**12**
	b)	Explain and analyze the Sweep-Line algorithm for determining whether any pair of line segments intersects.	**08**

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