Code No.: CS8201PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–M.TECH–II–Semester End Examinations (Supply) - March- 2023
ADVANCED ALGORITHMS
(CSE)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

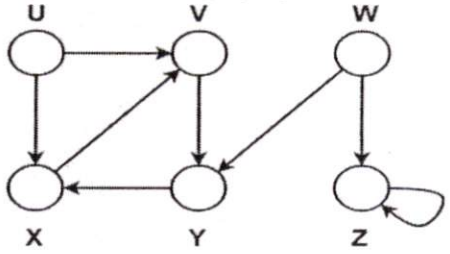
1. a) Define three asymptotic notations use to determine the running time of an algorithm. [2M]
   b) Give one example of amortized analysis. [2M]
   c) Outline augmenting path. [2M]
   d) Differentiate chromatic numbers in scheduling. [2M]
   e) Outline relation between time complexities of basic matrix operations. [2M]
   f) Recall inverse of a triangular matrix. [2M]
   g) Explain Chinese Remainder Theorem? [2M]
   h) List any two Examples of dynamic programming. [2M]
   i) Recall Interior point method. [2M]
   j) List any 2 Approximation algorithms. [2M]

PART-B **(50 Marks)**

2. What is minimum cost spanning tree? Build an algorithm for kruskals technique with Illustration. [10M]

OR

3. What is DFS? Build the DFS tree for the graph given below: [10M]



4. What is augmenting path? How it is computed with Edmond's Blossom Algorithm? [10M]

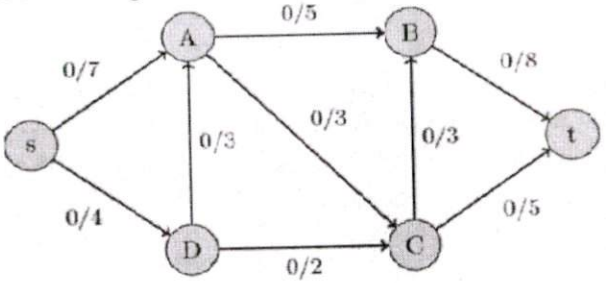
OR

5. Write an algorithm to find out maximum matching in graphs? [10M]

6. Explain Edmond-Karp maximum-flow algorithm with suitable example? [10M]

OR

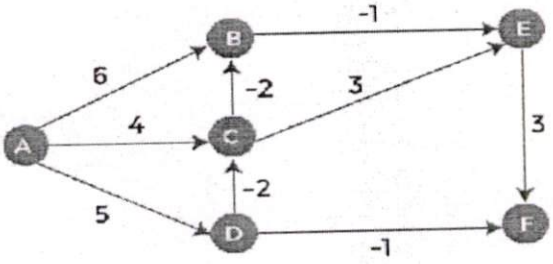
7. Find the maximum flow using Ford-Fulkerson method. [10M]



8. Examine the Floyd-Warshall algorithm on the weighted, directed graph with suitable example? [10M]

OR

9. Compute Bellman ford algorithm for the below graph and compute the time complexity [10M]



10. Illustrate Advanced Number Theoretic Algorithm? [10M]

OR

11. Explain NP-hardness and NP-completeness in detail? [10M]

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