

Roll No.

Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. (CSE) (Sem.-2)  
**ADVANCED ALGORITHMS**  
Subject Code : MTCS-201-18  
M.Code : 76055  
Date of Examination : 04-07-22

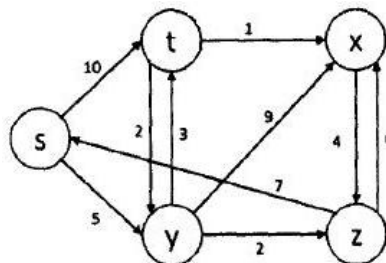
Time : 3 Hrs.

Max. Marks : 60

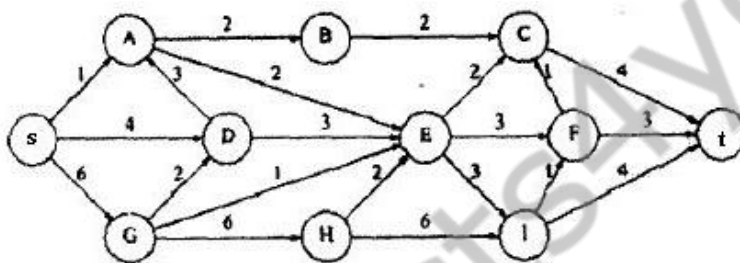
**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1. a) Explain fast fourier transform algorithm.  
b) What are NP, P and NP-complete problems?
2. Explain simplex algorithm in detail and analyze its complexity with the help of recurrence relations and tree.
3. a) Write an algorithm for inverse of a triangular matrix with the help of suitable example.  
b) Write the algorithm of quick sort. Find worst case complexity of it using iterative method.
4. a) How to represent modulo of polynomials, Write basic function. Explain interpolation problem.  
b) Explain how to find Longest Common Subsequence of two strings using Dynamic Programming Method.
5. Write Dijkstra's algorithm. Output the sequence of vertices identified by the Dijkstra's algorithm for single source shortest path when the algorithm is started at node s for the given weighted directed graph.



6.
  - a) Write an algorithm to compute a maximum weight maximal independent set.
  - b) What do you mean by polynomial time complexity and logarithmic complexity? Which one is higher?
7.
  - a) Why is it important that Strassen's algorithm does not use commutativity in the multiplication of  $2 \times 2$  matrices?
  - b) Explain Randomized algorithm with applications.
8.
  - a) State the difference between internal sorting and external sorting.
  - b) Find a topological ordering for the graph given below :



**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**