AI & DS / Comp. Engg.

(3 Hours) **Total Marks: 80**

N.B: (1) Question No. 1 is compulsory.
(2) Attempt any three from the remaining questions.
(3) Figures to the right indicate full marks.

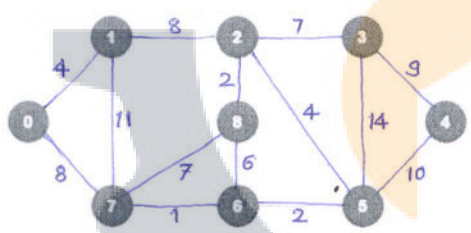
1. Attempt any four (20)
   (a) Explain recurrences and various methods to solve recurrences.
   (b) Explain in brief the concept of Multistage graphs?
   (c) Explain Asymptotic Notations.
   (d) Define P class, NP Class, NP-hard, NP-complete.
   (e) What is greedy algorithm?

2. (a) What is Knuth Morris Pratt Method of Pattern Matching? Give Examples. (10)
   (b) Sort the following numbers using Merge Sort also, derive the time complexity of Merge Sort 7, 2, 9, 4, 3, 8, 6, 1. (10)

3. (a) Explain and differentiate between greedy knapsack and 0/1 knapsack. (10)
   (b) Explain Backtracking with n-queen problem. (10)

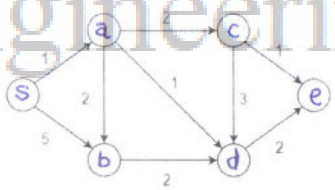
4. (a) Find the LCS for following strings (10)
   String 1- AGGTAB
   String 2- GXTXAYB
   (b) Explain quick sort with algorithm and example. (10)

5. (a) Find MST of following graph using prims and Kruskal's Algorithm. (10)



   (b) Write and explain sum of subset algorithm for n = 5, W = {2, 7, 8, 9, 15} M = 17. (10)

6. Write notes on any two: (20)
   (a) Write an algorithm to find the Minimum and Maximum values using divide and conquer strategy and also derive its complexity.
   (b) Explain Naïve string-matching algorithm with example.
   (c) Find the shortest path from source vertex S using Dijkstra's algorithm.



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