(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.

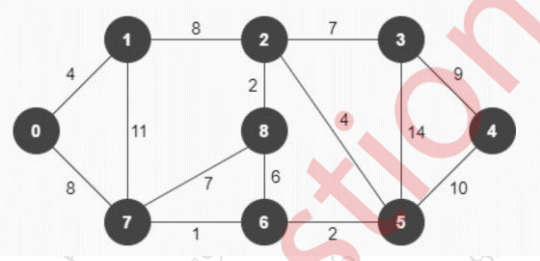
1. Attempt any four **(20)**
(a) Explain recurrences and various methods to solve recurrences.
(b) Explain in brief the concept of Multistage graphs?
(c) Explain Asymptotic Notations.
(d) Define P class, NP Class, NP-hard, NP-complete.
(e) What is greedy algorithm?

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)**

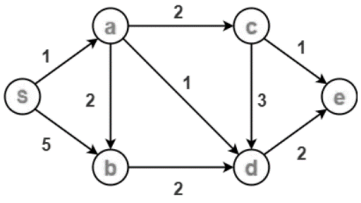
4. (a) Find the LCS for following strings **(10)**
String 1- AGGTAB
String 2- GXTXAYB
(b) Explain quick sort with algorithm and example. **(10)**

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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