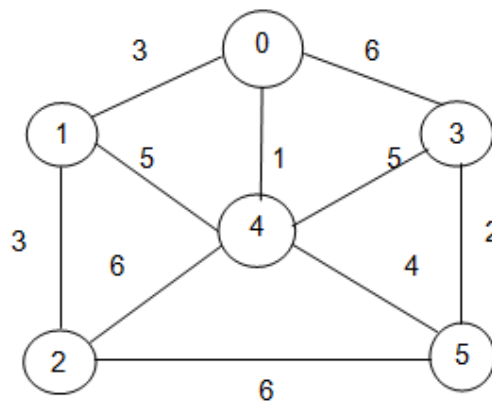


Time: 3 Hours

Max Marks: 80

- N.B. 1) Question No.1 is compulsory
 2) Solve any three questions from the remaining questions.
 3) Assume suitable data if necessary.

- 1 **Solve any four of the following**
- (a) Write and explain merge sort algorithm? 5
 - (b) Write algorithms for greedy knapsack problem with an example? 5
 - (c) Explain Big Oh and Big Theta? 5
 - (d) Explain Ford Fulkerson method? 5
 - (e) Explain multistage graph with example? 5
- 2 (a) Write and explain sum of subset algorithm for $N=5, W=\{2,7,8,9,15\}, M=17$? 10
 (b) Sort the following numbers using quicksort 50,31,41,38,77,81,16,34 ? 10
- 3 (a) Explain 15 puzzle problem using suitable algorithm? 10
 (b) Find MST of following graph using prim's algorithm? 10



- 4 (a) Describe the relationship among P, NP, NP-HARD, NP-COMPLETE? 10
 (b) Write an algorithm to find the minimum and maximum value using divide and conquer and also derive its complexity? 10
- 5 (a) Write an algorithm to solve N queens problem for $N=4$? 10
 (b) Explain Dijkstra's single source shortest path algorithm with an example? 10
- 6 **Write short notes on any two?** 20
 a) Longest Common Subsequence
 b) Recursion Tree Method
 c) Matrix multiplication
