PSG COLLEGE OF TECHNOLOGY

DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES

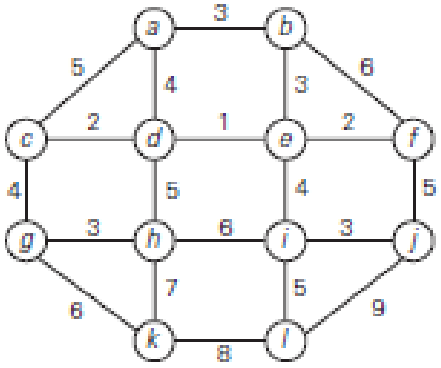
M.Sc (SS) – Design and Analysis of Algorithms

Home work 4 (Divide and conquer, Greedy approach)

1. Apply merge sort to sort the list *E, X, A, M, P, L, E* in alphabetical order. Check if the algorithm is stable.
2. Apply quick sort to sort the list A,B,C,D,E in alphabetical order. Check the number of comparisons by choosing (i) the first element as the pivot (ii) last element as the pivot.
3. Apply Strassen's algorithm to compute

$$\begin{bmatrix} 1 & 0 & 2 & 1 \\ 4 & 1 & 1 & 0 \\ 0 & 1 & 3 & 0 \\ 5 & 0 & 2 & 1 \end{bmatrix} * \begin{bmatrix} 0 & 1 & 0 & 1 \\ 2 & 1 & 0 & 4 \\ 2 & 0 & 1 & 1 \\ 1 & 3 & 5 & 0 \end{bmatrix}$$

4. Find the minimum spanning tree of the graph given below using
   (i) Prims algorithm
   (ii) Kruskals algorithm



5. Find the shortest path in the graph given below considering the source vertex as 'a' using dijkstra's algorithm.