1. Consider a complete undirected graph with vertex set V = {0, 1, 2, 3, 4}. Entry W[i][j] in the matrix W below is the weight of the edge (i, j) What is the minimum possible weight of a spanning tree T in this graph such that vertex 0 is a leaf node in the tree T. Briefly explain your answer. *(3p)*

a. 9
b. 7
c. 8
d. 10

$$W = \begin{pmatrix} 0 & 1 & 8 & 1 & 4 \\ 1 & 0 & 12 & 4 & 9 \\ 8 & 12 & 0 & 7 & 3 \\ 1 & 4 & 7 & 0 & 2 \\ 4 & 9 & 3 & 2 & 0 \end{pmatrix}$$

2. If a graph has 92 vertices, how many edges are in the minimum spanning tree? Briefly explain your answer. *(1p)*

a. 93
b. 91
c. 92
d. 9
e. Cannot be determined with the given information.

3. Given the weights and values of the items below, put these items in a knapsack of capacity W = 30 to get the maximum total value in the knapsack. Which is the maximum value obtained? Illustrate the steps in Knapsack Problem algorithm to answer. *(2p)*
val[] = { 60, 100, 120 };
wt[] = { 10, 20, 30 };

4. Simulate Dijkstra's algorithm on the edge-weighted graph below, starting from vertex 0. *(2p)*