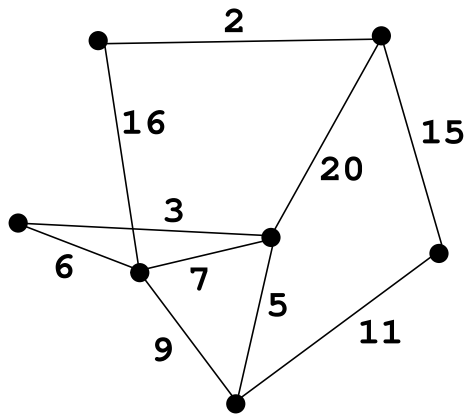
Quiz 3

1. Draw the finite state machine for matching the pattern $P = 0100$. Assume the binary alphabet $\Sigma = \{0, 1\}$.

2. Darken the edges of a minimum-weight spanning tree in the following weighted graph.



3. Suppose you implement the "Disjoint Set" ADT using a forest of trees, union-by-rank, and collapsing find. Draw the data structure that results at the end of the following sequence of operations. When Union-ing two trees of equal ranks, make the new root the tree with the *smaller* root item.

   Makeset(1); Makeset(2); Makeset(3); Makeset(4);

   Union(1,2); Union(3,4); Union(3,1); Find(4);