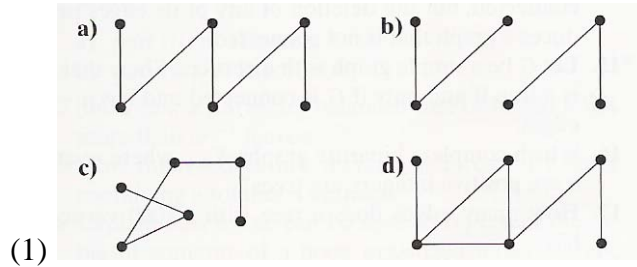## Foundations of Discrete Mathematics
## COT 2104

**Practice 11**

1) Which of these graphs are trees?



(1)

2) Answers these questions about the rooted tree illustrated

3) Which vertex is the root?
4) Which vertices are internal?
5) Which vertices are leaves?
6) Which vertices are children of f?
7) Which vertex is the parent of h?
8) Which vertices are siblings of o?
9) Which vertices are ancestors of m?
10) Which vertices are descendants of b?
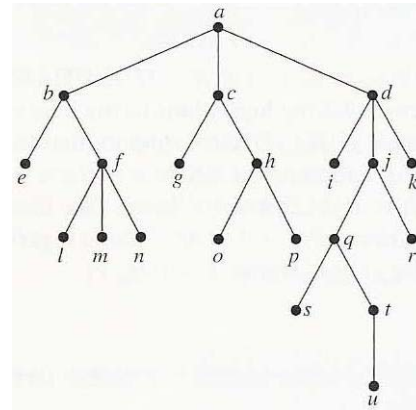


11) A complete m-ary tree is a full tree where every leaf is at the same level. Construct a complete binary tree of height 4 and a complete 3-ary tree of height 3.
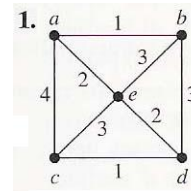
12) Build a binary search tree for the words banana, peach, apple, pear, coconut, mango, and papaya using alphabetic order.

13) Find a spanning tree for each graph shown by removing edges in simple circuits.
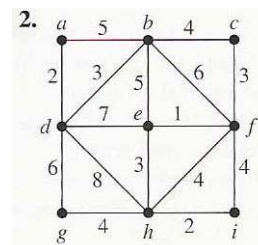
**2.**



**3.**



(a)
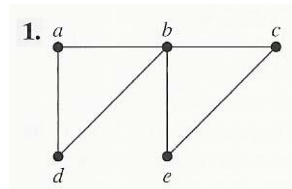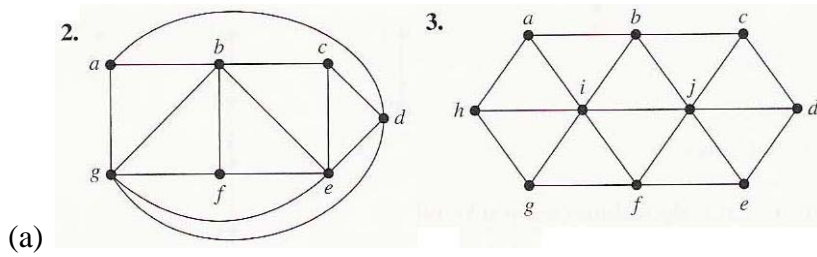
14) Use Prim's algorithm to find a minimum spanning tree for the given weighted graph

**1.**



15) Use Kruskal's algorithm to find the minimum spanning tree for the weighted graph of the picture.

**2.**



16) Use a depth-first search to produce a spanning tree for the given simple graph. Choose a as the root of this spanning tree and assume that the vertices are ordered alphabetically.

**1.**



**2.**