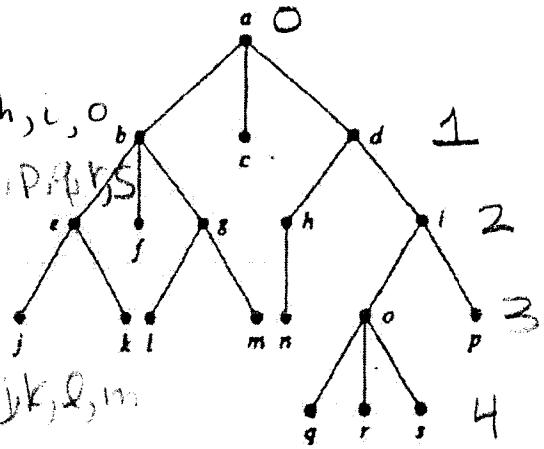
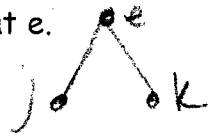
KEY

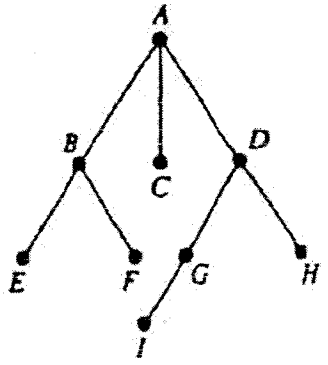
Worksheet—Trees

1) For the given tree, answer the following questions:
   a) Which vertex is the root? a
   b) Which vertices are internal? a, b, d, e, g, h, i, o
   c) Which vertices are leaves? c, f, j, k, l, m, n, p, q, r, s
   d) Which vertices are children of i? o, p
   e) Which vertex is the parent of h? d
   f) Which vertices are siblings of o? p
   g) Which vertices are ancestors of m? g, b, a
   h) Which vertices are descendants of b? e, f, g, j, k, l, m
   i) Find the level of each vertex.
   j) Draw the subtree rooted at e.

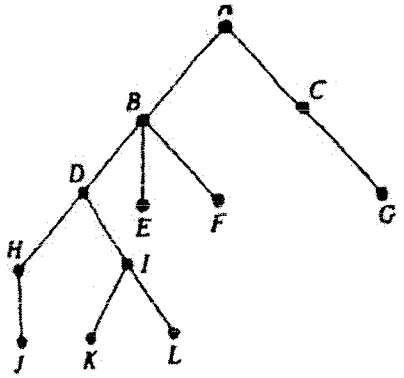




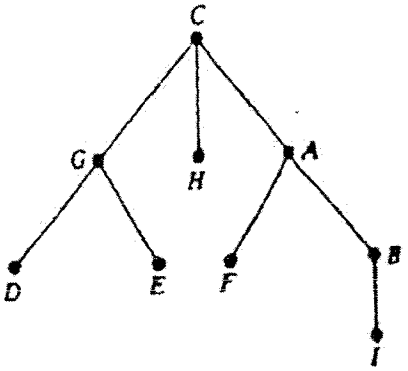
2) For the given tree, find:
   a) the root A
   b) the internal vertices A, B, D, G
   c) the terminal vertices C, E, F, H, I
   d) the parent of G D
   e) the children of B E, F
   f) the descendants of D G, H, I
   g) the ancestors of H D, A



3) For the given tree, find:
   a) the root A
   b) the internal vertices A, B, C, D, H, I
   c) the terminal vertices E, F, G, J, K, L
   d) the parent of G C
   e) the children of B D, E, F
   f) the descendants of D H, I, J, K, L
   g) the ancestors of H D, B, A



4) For the given tree, find:
   a) the root C
   b) the internal vertices C, G, A, B
   c) the terminal vertices H, D, E, F, I
   d) the parent of G C
   e) the children of B I
   f) the descendants of D none
   g) the ancestors of H C



5) For the given tree, find:

a) the root E

b) the internal vertices E, A, D, I, J

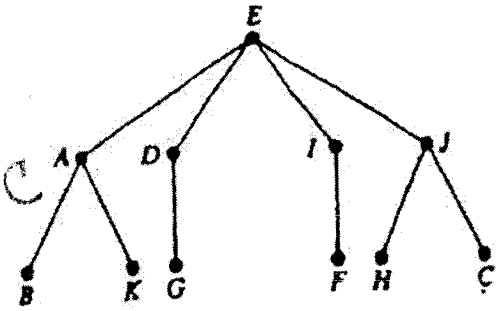
c) the terminal vertices B, K, G, F, H, C

d) the parent of G D

e) the children of B none

f) the descendants of D

g) the ancestors of H J, E



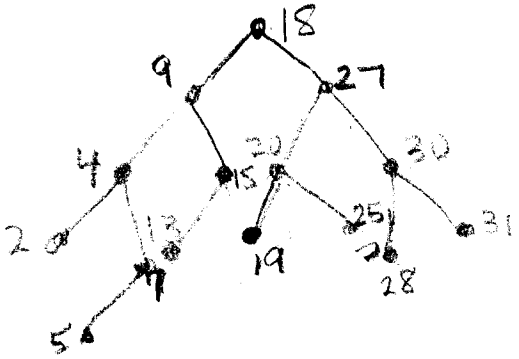
6) Find the level of vertex F in problem #2. 2

7) Find the level of vertex L in problem #3. 4

8) Find the level of vertex H in problem #4. 1

9) Find the level of vertex F in problem #5. 2

10) In a survey of 15 mathematics departments, it was found that there were **18, 9, 27, 20, 30, 15, 4, 13, 25, 31, 2, 19, 7, 5,** and **28** faculty members. Construct a binary search tree for the sizes of the faculty.



11) Build a binary search tree for the words ***banana, peach, apple, pear, coconut, mango, and papaya*** using alphabetical order.