Problem 5 Explanation:

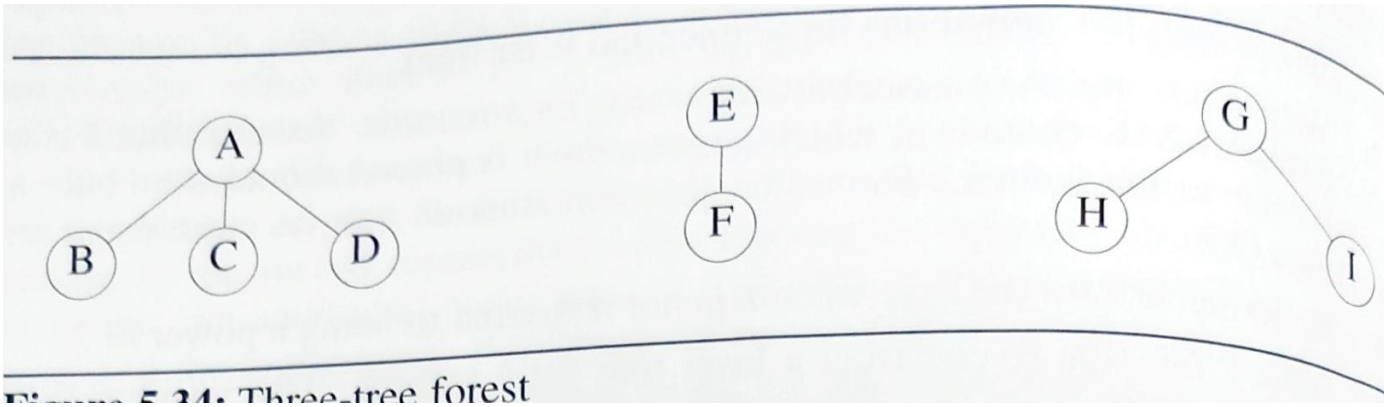

Figure 5.34: Three-tree forest

5.9.1 Transforming a Forest into a Binary Tree

To transform a forest into a single binary tree, we first obtain the binary tree representation of each of the trees in the forest and then link these binary trees together through the rightChild field of the root nodes. Using this transformation, the forest of figure 5.34 becomes the binary tree of figure 5.35.

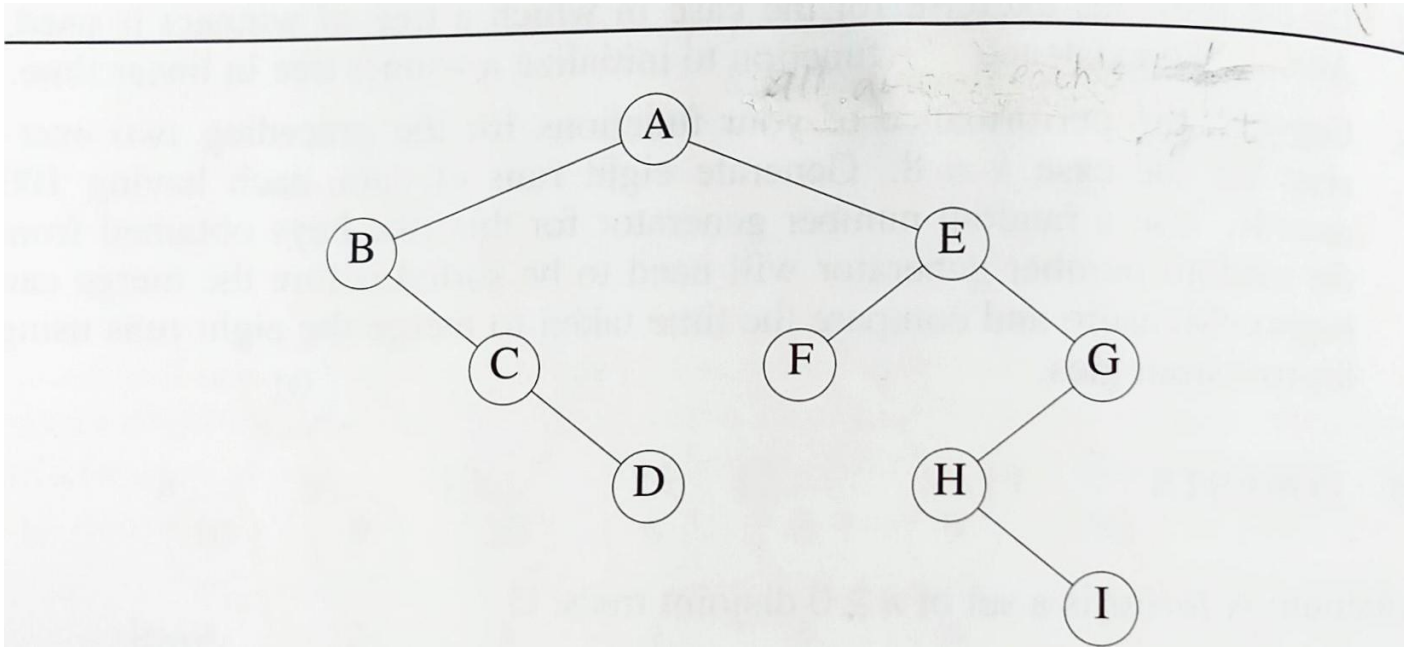

Figure 5.35: Binary tree representation of forest of Figure 5.34

We can define this transformation in a formal way as follows:

Definition: If T_1 ,…, Tn is a forest of trees, then the binary tree corresponding to this forest, denoted by B (T_1 ,..., T_n)

(1) is empty if n = 0

(2) has root equal to root (T_1); has left subtree equal to B (T_{11}, T_{12}, T_{1m}) where T_{11}, …, T_{1m} are the subtrees of root(T_1); and has right subtree B(T_2,..., T_n)