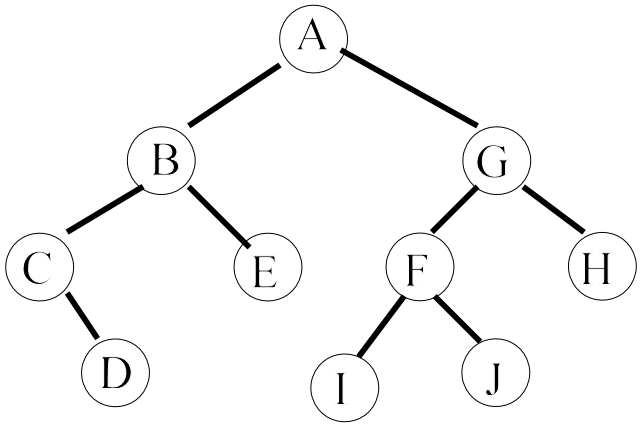
Chapter 12 Review

Assume that list, stacks, queues and trees are defined as we have throughout this chapter.

1) a) Draw diagrams showing 3 possible binary search trees containing the values 1, 2, 3, 4 and 5.
   b) How many different binary search trees with 3 or 4 as the root are possible?

2) The diagram shows a binary tree.



List the nodes of the binary tree in:

a) preorder

b) inorder

c) postorder

3) Draw a diagram showing the resulting binary search tree if the items shown here are inserted in the given order into an initially empty tree.

15, 5, 25, 6, 19, 3, 1, 20, 18, 2, 36, 30, 11, 8

4) Write a pair of methods, both called `prePrint` that will be used to recursively print the `info` fields of a tree using a preorder traversal.

5) Write an instance method `sum` for the `List` class that returns the sum of the values in the `info` fields of its implicit `List` object.

6) Determine the effect of the method `mystery` in the class `List`.

```
public void mystery(int i)
{
   Node a = head;
   Node b = null;
   boolean c = false;
   while (!c && a != null)
      if (a.info == i)
         c = true;
      else
      {
         b = a;
         a = a.link;
      }
   if (c)
      if (a == head)
         head = head.link;
      else
         b.link = a.link;
}
```

7) State the output from the following application.

```
public class Seven
{
   public static void main(String[] args)
   {
      Stack s = new Stack();
      s.push("one");
      s.push("two");
      s.push("three");
      System.out.println(s.pop());
      s.push("four");
      System.out.println(s.pop());
      s.push("five");
      s.push("six");
      System.out.println(s.pop());
      s.push("seven");
      s.push("eight");
      System.out.println(s.pop());
      System.out.println(s.pop());
      System.out.println(s.pop());
   }
}
```