b **Explain the event delegation model.**

The Delegation Event Model

The modern approach to handling events is based on the *delegation event model*, which defines standard and consistent mechanisms to generate and process events. Its concept is quite simple: a source generates an event and sends it to one or more listeners. In this scheme, the listener simply waits until it receives an event. Once an event is received, the listener processes the event and then returns. The advantage of this design is that the application logic that processes events is cleanly separated from the user interface logic that generates those events. A user interface element is able to “delegate” the processing of an event to a separate piece of code.

In the delegation event model, listeners must register with a source in order to receive an event notification. This provides an important benefit: notifications are sent only to listeners that want to receive them. This is a more efficient way to handle events than the design used by the old Java 1.0 approach. Previously, an event was propagated up the containment hierarchy until it was handled by a component. This required components to receive events that they did not process, and it wasted valuable time. The delegation event model eliminates this overhead.

*NOTE* Java also allows you to process events without using the delegation event model. *However, the delegation event model is the preferred design for the reasons just cited.*

The following sections define events and describe the roles of sources and listeners.

**Events**

In the delegation model, an *event* is an object that describes a state change in a source. It can be generated as a consequence of a person interacting with the elements in a graphical user interface. Some of the activities that cause events to be generated are...
Inside the valueChanged( ) method, the path to the current selection is obtained and displayed.

// Demonstrate JTree.
import java.awt.*;
import javax.swing.event.*;
import javax.swing.*;
import javax.swing.tree.*;
/
<applet code="JTreeDemo" width=400 height=200>
</applet>
*/

class JTreeDemo extends JApplet {
    JTree tree;
    JLabel jlab;
    public void init() {
        try {
            SwingUtilities.invokeLater(
                new Runnable() {
                    public void run() {
                        makeGUI();
                    }
                }
            )
        } catch (Exception exc) {
            System.out.println("Can't create because of "+ exc);
        }
    }

    private void makeGUI() {
        // Create top node of tree.
        DefaultMutableTreeNode top = new DefaultMutableTreeNode("Options");
        // Create subtree of "A".
        DefaultMutableTreeNode a = new DefaultMutableTreeNode("A");
        top.add(a);
        DefaultMutableTreeNode a1 = new DefaultMutableTreeNode("A1");
        a.add(a1);
        DefaultMutableTreeNode a2 = new DefaultMutableTreeNode("A2");
        a.add(a2);
        // Create subtree of "B".
        DefaultMutableTreeNode b = new DefaultMutableTreeNode("B");
        top.add(b);
        DefaultMutableTreeNode b1 = new DefaultMutableTreeNode("B1");
        b.add(b1);
        DefaultMutableTreeNode b2 = new DefaultMutableTreeNode("B2");
        b.add(b2);
        DefaultMutableTreeNode b3 = new DefaultMutableTreeNode("B3");
        b.add(b3);
        // Create the tree.
        tree = new JTree(top);
        // Add the tree to a scroll pane.