N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labelled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.
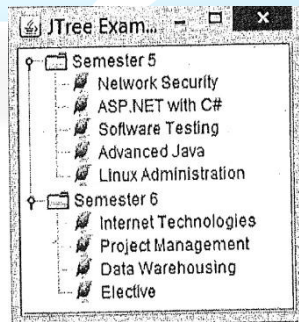
1. Attempt _any two_ of the following   **10**

   a. Explain the java delegation event model. What are the two steps in using the java delegation event model?
   b. Explain adapter classes and inner classes.
   c. Explain the following methods when working with frame windows.
        1. setSize
        2. getSize
        3. setVisible
        4. setTitle
        5. windowClosing
   d. what are the different LayoutManager classes in java? Explain CardLayout with example.

2. Attempt _any two_ of the following   **10**

   a. explain Root Pane, Glass Pane, Layered Pane, Content Pane and Desktop Pane.
   b. Distinguish between abstract window toolkit and java foundation classes.
   c. Explain JPopupMenu class with example.
   d. Write a program using JTree to generate the following hierarchical structure. Assume the image file is "leaf.jpg".

3.Attempt _any two_ of the following   **10**

   a. What are servlets? What are advantages of servlets over CGI?
   b. What are RequestDispatcher? What are its two methods? Using RequestDispatcher with code for the following.
        Index.html file with two text boxes to enter username and password and login button. **Login.java** servlet class to process the response. If the password is "servlet" it should forward request to **WelcomeServlet.java** which display "Welcome <username>". If the password is not "servlet" Login.java should display "Sorry Username or Password error!!!" **web.xml**, the deployment descriptor file that contain the information about the servlet.
   c. Explain GenericServlet with its constructors and methods.

d. Write servlet application to find the sum of digit of the number entered by the user through the HTML form.

4.Attempt *any two* of the following 10

    a. What is JDBC driver? Explain the types of JDBC drivers.
    b. Explain JDBC architecture.
    c. What are advantages and disadvantages of java server pages?
    d. Write a JSP application that computes the cube of the number from 1 to **10.**

5.Attempt *any two* of the following 10

    a. Explain MVC architecture.
    b. Explain in details phases of JSF lifecycle.
    c. Enumerate the benefits of enterprise beans.
    d. Write a session bean code specification that calculates simple interest. Assume the principal, term and rate of interest is entered by the user and the input is passed through a servlet.

6.Attempt *any two* of the following 10

    a. Explain the architecture of hibernate framework in details.
    b. Explain structure of hibernate.cfg.xml file.
    c. What is value Stack in struts? State and explain the Execution flow of value Stack.
    d. Explain interceptors in struts.

7.Attempt *any three* of the following 15

    a. What is CheckbobGroup? Explain with example.
    b. Explain JScrollPane and JScrollBar with example.
    c. Explain the lifecycle of servlet.
    d. Write JDBC program that insert values in database [TABLE NAME: Employee, FIELDS: Empid, Name,Dept,Designation]
    e. What are different types of enterprise beans? Explain.
    f. What is OGNL? Explain the execution flow of OGNL.