(3 Hours)   **[Total Marks: 100]**

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 labeled diagrams** wherever **necessary**.
   (6) Use of **Non-programmable** calculators is **allowed**.

1.   Attempt _any two_ of the following: 10
a.   What are Servlets? State the need and benefits.
b.   Explain the concept of Event Listener and also explain its types.
c.   Explain the concept of "Result" interface.
d.   State the intrinsic objects in JSP and explain any two.

2.   Attempt _any three_ of the following:
a.   How is event handling done in Java?
b.   What is JTree? What are Tree nodes and models?
c.   Write a swing program that creates a GUI for the order form. The order form should contain the following fields:
       Text Boxes to store Customer Name, quantity of the product and price of the same.
       Combo Box to select Product Name (From the list of products specified in the list).
        Buttons, one to submit data and another to clear the fields.
       Note: All input fields should be supported by appropriate labels.
       Event: GUI design should handle windowClosing () event.
d.   Explain the usage of Scrollbar control in Swing.
e.   Explain JInternalFrame with its constructors.
f.   How to create directory like structure in Swing? Explain with illustration.

3.   Attempt _any three_ of the following: 15
a.   Explain the GenericServlet with its constructors and Methods.
b.   Write a servlet application to accept a number from the user and display whether the number is multiple of 3 or not.
c.   Explain the life cycle of servlet.
d.   Explain the importance of request dispatcher of servlet in inter-servlet communication.
e.   Write short note on HttpServlet class.
f.   Explain the directory structure of Web Application for executing Servlet Application.

[Turn Over]

4. **Attempt _any three_ of the following:** 15
a. Write short note updatable resultset.
b. What are the different types of JDBC drivers? Explain.
c. What is scrollable resultset? Explain with example.
d. Explain the concept of "Character Quoting Conventions" in JSP.
e. Write a JDBC program that inserts values in database using prepared statement through keyboard input. [TABLE NAME: Employee. FIELDS: Empid, Name, Dept, Designation]
f. What are directives in JSP? Explain its types.

5. **Attempt _any three_ of the following:** 15
a Write short note on MVC architecture?
b Write a JSF program to accept the employee details and store them in the database.
c What is EJB? Explain the components of Enterprise bean architecture.
d Write a model and navigation rules to find the simple interest of a given principal, interest and terms. (in JSF)
e Explain the advantages of EJB.
f How JSF applications can be built, maintained and executed?

6. **Attempt _any three_ of the following:** 15
a. Explain structure of hibernate.cfg.xml.
b. Write a short on Interceptors in struts.
c. Enlist the core components of struts and explain about the interceptors.
d. Explain the architecture of hibernate framework in detail.
e. Explain the importance of mapping and show the creation of mapping file in hibernate framework.
f. Write a short note on "Struts framework"

7. **Attempt _any three_ of the following:** 15
a. Explain different type of Mail Protocols.
b. Write a short note on java mail API.
c. Explain the components of web services.
d. Explain the need of directory services in detail.
e. What is resource injection? What are its types?
f. Write presentation logic and the processing servlet to dispatch the mail to the given recipient.

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