(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. Write and explain steps for Java Database Connectivity.
b. What is Enterprise Java Beans? Explain its advantages.
c. Explain JTable class in swing with its constructors and methods.
d. Write a short note on Java Mail Protocols.

2. **Attempt _any three_ of the following:** **15**
a. Explain Delegation Event Model.
b. Differentiate between Swing and AWT components.
c. What is layout manager? Explain BorderLayout with an example.
d. Explain CheckboxGroup with an example.
e. How menus are created in java? What are the classes used for creating menus? Explain with an example.
f. Write a swing program to create GUI to check the number entered in the text box is even or odd.

3. **Attempt _any three_ of the following:** **15**
a. Explain life cycle of a Servlet.
b. Why to use Servlets? What can Servlets do?
c. What is RequestDispatcher? What are its two methods?
d. Explain HttpServletRequest and HttpServletResponse Interface.
e. Write a short note on javax.servlet package.
f. Write a servlet program to display the simple sentence Welcome along with the name entered by the user through an HTML Form.

4. **Attempt _any three_ of the following:** **15**
a. Explain all JDBC Drivers.
b. Explain difference between statement and prepared statement.
c. Explain directives and actions in JSP.
d. Write a short note on Session Tracking in JSP.
e. What are the different types of Unified Expression Language? Explain all in detail.
f. Develop a simple JSP application to display values obtained from the use of intrinsic objects of various types.

5. **Attempt _any three_ of the following:** **15**
a List and explain all the components of Java Server Faces
b List and explain types of session beans.
c What is meant by Renderer? What are its types?
d Write a short note on Message Driven Bean.
e Explain the Model View Controller pattern used in the JSF.
f Explain life cycle of Stateful Session Bean.

6.   Attempt *any three* of the following: **15**
a.   What is hibernate? What are different RDBMS supported by hibernate?
b.   Explain the concept of Object Relational Mapping.
c.   What is struts? Explain its architecture.
d.   Explain all the configuration files created in hibernate applications.
e.   Explain the components of Hibernate.
f.   What are the mandatory steps used by the struts?

7.   Attempt *any three* of the following: **15**
a.   Explain the basic steps for creating the web services and client.
b.   Write a short note on JavaMail Architecture.
c.   Explain the Naming and Directory Services in JNDI.
d.   Explain the following terms:
         1. Mail server
         2. Message Store
         3. Message Transfer Agent
         4. Mail User Agent
         5. Messaging System
e.   List and Explain packages and methods required in JNDI.
f.   What are the requirements for Java API for XML [JAX-WS] endpoint?

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