(2½ Hours)

[Total Marks: 75]

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 three_ of the following: **15**
a.   What are the different types of Containers in Java Enterprise Edition?
b.   Write a servlet program in Java using JDBC to accept the Customer details such as Customer ID, Customer Name and Contact No. from the user via HTML form and store the same in the database.
c.   What are the life cycle methods of a servlet? Describe with suitable diagram.
d.   How is Servlet better than CGI?
e.   Explain JDBC drivers in detail.
f.   Write a note on Deployment descriptor file with elements.

2.   Attempt _any three_ of the following: **15**
a.   How many types of Cookies are there in Servlet? Where are they used?
b.   Write a program using Servlet application to upload a file.
c.   Define Request Dispatcher interface. List its two methods with code snippet.
d.   What are Sessions? Elaborate different methods of Session Tracking.
e.   Define following methods of Cookie class.
       i.   getMaxAge()
       ii.   getSecure ()
       iii. getValue()
       iv.   getDomain()
       v.   setPath()
f.   Write a note on nonblocking I/O.

3.   Attempt _any three_ of the following: **15**
a.   What are JSP directives? Explain different types of directives with example.
b.   Define following action elements in JSP with suitable code example.
       i.   Jsp:include
       ii.   Jsp:forward
       iii. Jsp:param
       iv.   Jsp:setProperty
       v.   Jsp:getProperty
c.   Write a program to accept roll no, name, age using HTML. Update the student_details table using JSP page.
d.   List the name of JSP implicit objects. Explain any three in detail.
e.   Explain JSP life cycle with proper diagram.
f.   What are different JSP Standard Tag Libraries (JSTL)? Explain any 4 JSTL function tags with proper syntax.

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4.   **Attempt _any three_ of the following:**   **15**
a   What are the benefits of Enterprise Java Bean?
b   Write a note on Enterprise Bean Architecture.
c   Define Message Driven Bean with its lifecycle.
d   What are Interceptors? Why are they used?
e   Write a note on:
     i.   Stateful Session Bean
    ii.   Stateless Session Bean
f   What is Java Naming and Directory Interface? Explain.

5.   **Attempt _any three_ of the following:**   **15**
a.   Describe the architecture of Java Persistent API with suitable diagram.
b.   What are the different components of Hibernate?
c.   Define Impedance Mismatch. What is a solution to the Impedance Mismatch?
d.   Write a note on Java Persistent API.
e.   Enlist the benefits of Object Relational Mapping.
f.   Elaborate the architecture of Hibernate with suitable diagram.

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