

(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**

- Briefly explain any two technologies offered by the Java EE platform.
- What is enterprise architecture? Why is it important in organizations?
- Describe servlet life cycle with the help of a suitable diagram.
- Why are servlets preferred over CGI, and what advantages do servlets offer?
- Write a short note on Type III Driver.
- Explain how a PreparedStatement is created and executed in Java Database Connectivity.

2. Attempt any three of the following:**15**

- Write a note on RequestDispatcher.
- Define cookies. How can they be set and retrieved using servlets?
- What are sessions? Discuss various methods of session tracking.
- Explain the following methods of the HttpSession interface along with their proper syntax.
 - isNew()
 - invalidate()
 - getCreationTime()
 - getLastAccessedTime()
 - setMaxInactiveInterval()
- How does non-blocking I/O work?
- Write a program to download file-using servlet.

3. Attempt any three of the following:**15**

- What are directives in JSP? Explain its types.
- Describe the different stages in the lifecycle of a Java Server Page?
- How are JavaBeans accessed in JSP? Explain with appropriate action tags.
- List and explain any five Implicit Objects of JSP with their methods.
- What is JSTL? How does JSTL address the shortcomings of scriptlets?
- Write a JSP program to calculate and display compound interest. Assume the principal amount, rate of interest, and number of years are provided by the user as input.

4. Attempt any three of the following:

15

- Write a note on Enterprise Java Bean architecture.
- Explain various benefits of Enterprise Bean.
- What are Session Beans in Java EE? Describe the different types of Session Beans.
- Illustrate the life cycle of a Message Driven Bean along with a suitable diagram.
- What are Interceptors in Java EE? Define the role of the @AroundInvoke annotation in Interceptors?
- Write a note on Java Naming and Directory Interface (JNDI).

5. Attempt any three of the following:

15

- How is persistence implemented in Java?
- Define Object-Relational Mapping (ORM). Explain the benefits for ORM in software development.
- Explain architecture of JPA2.0.
- Discuss Hibernate and its advantages.
- Describe the architecture of Hibernate and include a suitable diagram to illustrate it.
- What is the purpose of the persistence.xml file in JPA and define its key components?