

		Regular	
Exam.		Full Marks	80
Level	BE	Pass Marks	32
Programme	BEX, BCT	Time	3 hrs.
Year/Part	IV / II		

Subject: - Enterprise Application Design and Development (Elective III) (CT78504)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. What is Java EE framework? How does it help to develop enterprise application in full scale? [1+6]
2. What is structural design patterns? Explain any two kinds of it in details. [1+3+3]
3. What is JDBC? Express your idea on JDBC framework. [1+5]
4. What is SOAP? Describe any 10 principles of SOA Architecture. [2+6]
5. What is Java EE Application Model? Explain different kinds of Java EE clients. [1+6]
6. What is Entity Bean? Explain the role of Interceptors in Java EE with neat diagram. [1+4]
7. Write briefly about any three: [3+3+3]
 - a) JSTL
 - b) EL
 - c) JAXB
 - d) JPA
8. What is servlet? Explain about JSP implicit objects. [1+4]
9. What is Web 2.0? What is JQuery? Explain at least 10 JQuery DOM manipulation methods. [2+1+3]
10. What is Ajax? Give the overview of Ajax in web application. [1+4]
11. What is 'DWR'? Explain in detail the Java Ajax Framework [6]
12. Write short notes on: (any three) [3+3+3]
 - a) <JSP: include> Vs <%> include%>
 - b) EJB3.0 Architecture
 - c) Singleton Pattern
 - d) Directives in JSP

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1. What is an enterprise? What characterizes an enterprise application? [2+3]
2. a) What is a design pattern? What is its significance? [2+3]
b) Describe the abstract factory pattern along with an example. [5]
3. Explain the benefits of using a multi-tiered architecture in application development. Briefly explain the functions of data, business, services and presentation layers in an application architecture. [5+5]
4. a) What is the significance of XML? Briefly explain how a DOM parser for XML works. [2+3]
b) What is the use of XML Schema? What is the role of XSLT? [2 + 3]
5. What are the details encoded in a WSDL document? How is a RESTful web service different from a SOAP-based web service? [5+5]
6. Describe the different components and containers in Java EE architecture. Compare annotations and deployment descriptors in Java EE? [5 + 3]
7. What are message driven beans? Describe how they work in Java Messaging System. [2+5]
8. What is persistence context in Java Persistence API? How do you convert a POJO into an entity? [5+2]
9. Explain the JavaServer Faces (JSF) architecture for web application development. Describe the function of Expression Language in JSF. [5+3]
10. What is the significance of AJAX? Describe how AJAX works. [2+3]

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Subject: - Enterprise Application Design and Development (Elective I)

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1. What do you understand by Software Architecture? Explain N-tier architecture with example. How is N-tier architecture different from layered architecture? [2 + 3 + 1]

2. What do you understand by Software Design Patterns? For each of these requirements identify one (or more) GoF pattern that can be use and briefly justify your choice: [2 + 6]

You are required to enhance an existing banking software.

The original software worked only with the SCT network now we need to make that accessible through the Visa Electron network as well. Visa Electron has provided with their API which has a different set of methods than that of the SCT network.

- *Since both of the networks have to provide similar features, you note that the methods differ only in their names and how the parameters are passed. You need to interface to the new network with minimal changes to your business logic, if possible just a wrapper over the SCT interface.*
- *There is a UserDetails object that needs to be created for each user who logs in. You note that building this object is a complicated process with 6 distinct steps - each step requiring connecting with different servers and complex business logic thereafter. The logic is different for SCT and Visa networks. You need to centralize this object building process so that it is easier to test and reuse.*
- *Visa Electron network has a feature of caching current balance so as to minimize the need to communicate with the central server every time. But if the balance changes the cache must be updated / invalidated. Polling of the central server is not feasible. You need to implement this some other way.*

3. Explain JDBC architecture. What is a PreparedStatement? What are the uses of a PreparedStatement? How does a PreparedStatement prevent SQL attacks? [3 + 1 + 3 + 2]

What is XML? Write down basic rules of XML. [2 + 4]

How do Web Services work? Explain the structure of a SOAP message. [4 + 2]

What do you understand by Session? How session is managed by Servlet container? What are the advantages of JSP over Servlet? [2 + 3 + 3]

Write about types of Dependency Injection with sample code. [6]

8. What do you understand by Web 2.0? How do Web 2.0 applications differ from traditional web applications? [2 + 3]

9. Write briefly about any three of the following Java EE technologies: [3 + 3 + 3]

- a. JAX-RS (Java API for RESTful Web Services)
- b. JPA (Java Persistence API)
- c. EL (Expression Language)
- d. JSF (Java Server Faces)
- e. Java Mail API

10. Write the difference between:

- a. `<jsp:include>` action and `<%@ include >` directive
- b. `<jsp:include>` action and `<jsp:forward>` action
- c. `<% %>` and `<jsp:scriptlet>` `</jsp:scriptlet>`
- d. `<%! %>` and `<% %>` in JSP
- e. `complexType` and `simpleType` in XML Schema
- f. `<sequence>` and `<all>` in XML Schema

11. What is a Filter in Java EE? How does it work? Give an example with sample code. [1 + 2 + 2]

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Subject: - Enterprise Application Design and Development (*Elective II*)

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1. Explain MVC architecture with examples. Is MVC architecture same as a 3-tier architecture? 6 + 3
2. What do you mean by design pattern? Explain any 2 GoF design patterns. 2 + 8
3. Explain JDBC architecture. What is a Connection pool? Give some examples of Connection Pool. 3 + 3 + 3
4. What do you understand by Service Oriented Architecture? What are the entities of SOA? 2 + 6
5. When can we say an XML document is well-formed? Explain with examples. 8
6. Explain the lifecycle of a Servlet. Explain how an HTTP request is handled by a web server. 4 + 4
7. How do you inject dependency and where is dependency injection applicable? Explain with one example of OO programming. 6
8. How Web 2.0 is changing business model? What do you think are the key factors of Web 2.0? 4 + 4
9. What will be the effect of the following lines in JSP: 1 + 1
 - a. `<%!-- xx --%>`
 - b. `<!-- xx --!>`
10. Explain briefly about any two Java EE APIs. 6
11. How are Web Services discovered? Write about the key technologies involved. 6

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1. What do you understand by Software Architecture? Explain N-tier architecture with example. How is N-tier architecture different from layered architecture? [2+3+1]
2. How are design patterns classified by GoF (Gang of four)? Explain any 2 GoF design patterns. [3+4+4]
3. Explain JDBC architecture. What is a PreparedStatement? What are the uses of a PreparedStatement? How does a PreparedStatement prevent SQL attacks? [3+1+3+2]
4. What do you understand by Service Oriented Architecture? Explain how it works. [2+4]
5. How do Web Services work? Explain the structure of a SOAP message. [4+2]
6. Explain the lifecycle of a JSP page. Explain briefly about the following implicit objects in JSP: [4+4]
 - a) Session
 - b) Request
7. Write about types of Dependency Injection with sample code. [5]
8. What is Web 2.0? Explain how Web 2.0 embraces architecture of participation. [2+3]
9. Write briefly about any three of the following Java EE technologies: [3+3+3]
 - a) JAX-RS (Java API for RESTFUL Web Services)
 - b) JPA (Java Persistence API)
 - c) EL (Expression Language)
 - d) JSF (Java Server Faces)
 - e) Java Mail API
10. Write the difference between [10]
 - a) `<jsp:include>` action and `<%@include >` directive
 - b) `<jsp:include>` action and `<jsp:forward >` action
 - c) `<% ! %>` and `<% % >` in JSP
 - d) CDATA and PCDATA
 - e) Complex Type and simple Type in XML Schema
11. What is a Filter in Java EE? How does it work? Give an example with sample code. [1+3+2]