



UCSC

University of Colombo, Sri Lanka

University of Colombo School of Computing



**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY
(EXTERNAL)**

Academic Year 2025 — 2nd Year Examination — Semester 4

IT4206 — Enterprise Application Development

Part 1 - Multiple Choice Question Paper

(2 Hours for both Part 1 and Part 2)

Important Instructions

- This paper has **two (2) parts, Part 1 and Part 2**.
- The total duration of **both Part 1 and Part 2 is 2 hours**.
- The final mark for the paper will be determined by averaging the scores of Part 1 and Part 2, each of which is graded out of **100**.
- The medium of instructions and questions is English.
- This paper (Part 1) has **25 MCQ questions** on **8 pages**. Answer **all** questions.
- Each question will have **5 (five)** choices with **ONLY ONE** correct answer.
- Answers should be marked on the **special answer sheet** provided.
- Note that questions appear on both sides of the paper. If a page or part of a page is not printed, please inform the supervisor/invigilator immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**
- Any electronic device capable of storing and retrieving text, including electronic dictionaries, smartwatches, mobile phones, and Calculators are **not** allowed.
- *All Rights Reserved.* This question paper can NOT be used without proper permission from the University of Colombo School of Computing.

- 1). Which Java EE API is primarily used to handle client requests and implement server-side logic in web applications?

(a) Enterprise JavaBeans	(b) Servlet	(c) JavaServer Faces
(d) Java Persistence API	(e) JavaServer Pages	

- 2). Which of the following best describes the primary purpose and capability of the Java EE platform?

- | |
|---|
| <ul style="list-style-type: none">(a) It provides the core syntax, basic data types, and foundational class libraries for the Java language.(b) It is a framework optimised primarily for developing native desktop user interfaces and standalone client applications.(c) It delivers an API and runtime environment specifically designed for building and deploying large-scale, multi-tiered enterprise applications.(d) It serves as a specialised, lightweight operating system designed to manage local server hardware directly.(e) It is a client-side scripting language used to control browser behaviour and modify DOM elements. |
|---|

- 3). In software architecture, what term is used to describe the secondary operations such as logging, security, and transaction management that are necessary to keep an entire system running correctly and efficiently, but are not part of the core business logic?

- | |
|---|
| <ul style="list-style-type: none">(a) Core Concerns(b) Functional Requirements(c) Monolithic Dependencies(d) Cross-Cutting Concerns(e) Architectural Frameworks |
|---|

- 4). In Enterprise JavaBeans (EJB), which lifecycle callback annotation is used to designate a method that should be executed immediately after a stateful session bean has been successfully activated?

(a) @PostActivate	(b) @PrePassivate	(c) @PostConstruct
(d) @PreDestroy	(e) @Remove	

5). In Java Remote Method Invocation (RMI), what is the primary function of the RMI Registry?

- (a) It acts as a client-side component that directly serialises and transmits method parameters over the network.
- (b) It automatically generates and compiles the stub and skeleton class files at runtime during network transmission.
- (c) It functions as a persistent database engine used to permanently store the internal state of remote service objects.
- (d) It is a multi-threaded web server used exclusively to host static HTML assets and user interface elements.
- (e) It serves as a bootstrap naming service that allows RMI servers to bind remote objects to unique names, enabling clients to look up those references.

6). In Java EE 7 deployment architecture, which of the following statements accurately describes the packaging rules for application modules?

- (a) Web applications are typically packaged as JAR files for deployment directly to an application server container.
- (b) A Web Archive (WAR) file is designed to contain Enterprise Archive (EAR) files as well as low-level operating system binaries.
- (c) An Enterprise Archive (EAR) file cannot be directly deployed to an application server; its internal components must be deployed individually.
- (d) An Enterprise Archive (EAR) file can encompass Web Archive (WAR) files, Enterprise JavaBeans JAR files, and deployment descriptors.
- (e) Application clients and enterprise beans must always be packaged inside a WAR file before they can be executed by the EJB container.

7). In a distributed computing architecture (such as RMI), which of the following accurately describes the primary responsibility of a server-side helper?

- (a) It resides within the same memory heap as the client application to manage local object references.
- (b) It intercepts the client's initial local method invocation and handles the network serialisation.
- (c) It unmarshals the client request, invokes the actual method on the remote service object, and marshals the return value back to the client helper.
- (d) It bypasses the remote service object entirely to stream data directly into the client-side user interface.
- (e) It acts as a dedicated database driver to persist remote method states into a physical storage engine.

8). In Enterprise JavaBeans (EJB), which type of session bean is designed to maintain a conversational state with a specific client across multiple method invocations?

- | | | |
|----------------------------|---------------------------|----------------------------|
| (a) Stateless Session Bean | (b) Stateful Session Bean | (c) Singleton Session Bean |
| (d) Message-Driven Bean | (e) Request-Scoped Bean | |

9). In the Enterprise JavaBeans (EJB) lifecycle, which of the following states is a stateless session bean never in?

- | | | |
|--------------------|-------------------|-------------|
| (a) Does Not Exist | (b) Ready | (c) Passive |
| (d) PreDestroy | (e) PostConstruct | |

10). In Enterprise JavaBeans (EJB) architecture, under what specific lifecycle condition is a method annotated with @PostActivate invoked on a stateful session bean?

- | |
|---|
| (a) When a client explicitly invokes a removal method, causing the bean to transition from the Ready state to the Does Not Exist state. |
| (b) During the initial instantiation process when the bean transitions from the Does Not Exist state to the Ready state. |
| (c) When a bean residing in the Ready state times out and is transitioned directly to the Does Not Exist state. |
| (d) Immediately before the stateful session bean is passivated and its state is written to secondary storage. |
| (e) Immediately after the stateful session bean has been successfully activated from secondary storage. |

11). What is the control message used in WebSockets to inform that the sender is going to end the connection?

- | | | |
|-----------|----------|----------------|
| (a) ping | (b) text | (c) disconnect |
| (d) close | (e) end | |

12). In the Java Persistence API, which annotation is applied to an entity's primary key field to specify that its unique identifier value should be automatically generated by the persistence provider?

- | | | |
|------------------------|---------------------|-----------------------|
| (a) @Generator | (b) @GeneratedValue | (c) @GenericGenerator |
| (d) @SequenceGenerator | (e) @Id | |

13). According to the Java EE specification, what are the two primary server-side containers that manage the execution of application components?

- (a) Database Container and Java EE Container
- (b) Enterprise Container and Cloud Container
- (c) Druid Container and Application Client Container
- (d) Web Container and EJB Container
- (e) Servlet Container and HTTP Container

14). In the Java Persistence API, which annotation is used to configure object-relational mapping for object-oriented inheritance relationships (an “Is-A” relationship)?

- | | | |
|------------------|-----------------|--------------------------|
| (a) @Inheritance | (b) @IsAMapping | (c) @DiscriminatorColumn |
| (d) @Temporal | (e) @Column | |

15). Which of the following statements accurately describes a core architectural characteristic of the Hypertext Transfer Protocol (HTTP)?

- (a) It is inherently stateful, meaning the server naturally retains client data across multiple request-response cycles.
- (b) It is a stateless protocol, where each request from a client is treated as an independent transaction unrelated to any previous request.
- (c) It operates exclusively over UDP to prioritise raw data transmission speed over packet delivery guarantees.
- (d) It requires a permanent, continuous transport-layer connection that cannot be closed once established.
- (e) It is a transport-layer protocol responsible for the physical routing of data packets across network routers.

16). In a standard multi-tier Java EE enterprise application architecture, which tier is primarily responsible for exposing system functionality via web services protocols such as SOAP and REST?

- (a) Business Logic Tier
- (b) Client Tier
- (c) Web Tier
- (d) Database Tier
- (e) Enterprise Information Systems Tier

17). In Java EE deployment architecture, which of the following statements identifies **an incorrect** feature or use case of an Enterprise Archive (EAR) file?

- (a) It is a compressed archive containing one or more Web Archive (WAR) or Enterprise JavaBeans (EJB) JAR modules.
- (b) It is highly beneficial in enterprise scenarios where a single complex application must bundle multiple independent web modules.
- (c) It simplifies enterprise deployment by allowing multi-module systems to be deployed simultaneously to an application server.
- (d) It streamlines lifecycle management by treating a distributed, multi-tiered enterprise application as a single deployable unit.
- (e) It is primarily designed to directly house localised UI assets such as static HTML, raw images, CSS stylesheets, and client-side JavaScript.

18). In the Enterprise JavaBeans (EJB) specification, which of the following is classified as a container lifecycle callback method?

- | | | |
|--------------------------|-----------------------|-----------------------|
| (a) ejbPassivate() | (b) setRollbackOnly() | (c) getRollbackOnly() |
| (d) getUserTransaction() | (e) lookup() | |

19). Which element within the Java web application deployment descriptor (web.xml) is responsible for defining the actual public-facing web address or URL routing path mapped to a specific servlet?

- | | | |
|-----------------------|--------------------|---------------------|
| (a) <servlet> | (b) <servlet-name> | (c) <servlet-class> |
| (d) <servlet-mapping> | (e) <url-pattern> | |

20). Which Java interface is used by the servlet container to pass unique initialisation parameters and configuration metadata to a specific servlet instance during its initialisation phase?

- | | | |
|--------------------|------------------------|-----------------|
| (a) ServletConfig | (b) ServletContext | (c) HttpSession |
| (d) ServletRequest | (e) ServletInputStream | |

Refer to the following code segment to answer the questions from 21 to 25.

```
1 import javax.servlet.*;
2 import javax.servlet.http.*;
3 import java.io.*;
4 import java.util.*;
5 import java.sql.*;
6 import javax.servlet.annotation.WebServlet;
7
8 [ Blank A ](urlPatterns = "/savelogin", name = "savelogin")
9 public class savelogin extends [ Blank B ] {
10     public void [ Blank C ](HttpServletRequest request, HttpServletResponse
        response)
11         throws ServletException, IOException {
12         String username = request.getParameter("username");
13         String password = request.getParameter("password");
14         try {
15             Class.forName("com.mysql.jdbc.Driver");
16             Connection con = DriverManager.[ Blank D ]("jdbc:mysql://
        localhost:3306/users", "root", "12345678");
17             Statement stmt = con.createStatement();
18             String insertUser = "INSERT INTO loginTbl (uname, pass) values(' "
        +username+"', '"+password+"')";
19             stmt.[ Blank E ](insertUser);
20             stmt.close();
21             con.close();
22             PrintWriter out = response.getWriter();
23             out.println("<html><head><title>Data Saved</title></head>");
24             out.println("<body><h2>Data Saved...</h2></body>");
25             out.println("</html>");
26         }
27         catch (Exception e) {
28             e.printStackTrace();
29         }
30     }
31 }
```

21). Which of the following annotations must be placed in [Blank A]?

- | | | |
|--------------------|-----------------|-----------------|
| (a) @OnOpen | (b) @OnConnect | (c) @WebServlet |
| (d) @NewConnection | (e) @Initialize | |

22). In the Java Servlet API architecture, which class must `savelogin` inherit from in [Blank B] to fully inherit the lifecycle capabilities required to process HTTP-specific protocol requests?

- | | | |
|--------------------|-------------------|--------------------|
| (a) Servlet | (b) HttpServlet | (c) GenericServlet |
| (d) HttpController | (e) WebController | |

23). When an HTML login form submits credential data via the HTTP POST method, the web container routes the request to the corresponding handler within the servlet. Which lifecycle method name must be filled in [Blank C] to correctly process this request?

- | | | |
|--------------------|-------------|------------|
| (a) service | (b) doGet | (c) doPost |
| (d) processRequest | (e) execute | |

24). To successfully establish a network session with the underlying database engine using the provided URL, username, and password credentials, which factory method from the `DriverManager` class must be invoked in [Blank D]?

- | | | |
|-----------------|----------------------|-------------------|
| (a) connect | (b) createConnection | (c) getConnection |
| (d) openSession | (e) getDatabase | |

25). The servlet needs to run the SQL INSERT statement defined in the `insertUser` string variable to insert the user credentials into the database. Which statement must be placed in [Blank E] to execute this database write operation?

- | | | |
|-------------------|------------------|-------------|
| (a) executeQuery | (b) executeWrite | (c) execute |
| (d) executeUpdate | (e) runQuery | |

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