



University of Colombo, Sri Lanka

University of Colombo School of Computing



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

Academic Year 2026— 2nd Year Examination — Semester 4

IT4206 — Enterprise Application Development

Part 2 - Structured Question Paper

(ONE HOUR)

To be completed by the candidate

Index Number

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Important Instructions

- The duration of the paper is **ONE HOUR**.
- The medium of instructions and questions is English.
- This paper has **2** questions and **5** pages.
- Answer both questions. Both questions carry **equal** marks.
- **Write your answers in English** using the space provided **in this question paper**.
- Do not tear off any part of this answer book.
- Under no circumstances may this book (or any part of this book), used or unused, be removed from the Examination Hall by a candidate.
- Questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
- Any electronic device capable of storing and retrieving text, including electronic dictionaries and mobile phones, are **not allowed**.
- Calculators are **not allowed**.
- *All rights reserved.*

**To be completed by
the examiners**

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2	

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1. (a). Explain the primary advantages of utilising **Java EE** over **Java SE** when designing and developing **enterprise-level applications**.

[10 marks]

An enterprise application (EA) is a large software system platform designed to operate in a corporate environment such as business or government.

The Java EE specification provides for a large number of APIs typically used by enterprise applications such as web services, asynchronous messaging, transactions, database connectivity, thread pools, batching utilities, and security. There is no need to develop these components manually, thereby reducing development time.

Topic 1 - Page 5-9

- (b). Briefly explain the architectural issues introduced by a **God Class** and the standard technique used to resolve it.

[6 marks]

knows too much and does too much. This can be refactored to smaller and manageable parts. Topic 1 - page 24

- (c). State **two (2)** primary advantages of adopting a **Component-Based Development (CBD)** approach when architecting enterprise software.

[6 marks]

Minimized Delivery, Improved Efficiency, Improved Quality, Minimized Expenditure

Topic 1 - page 26

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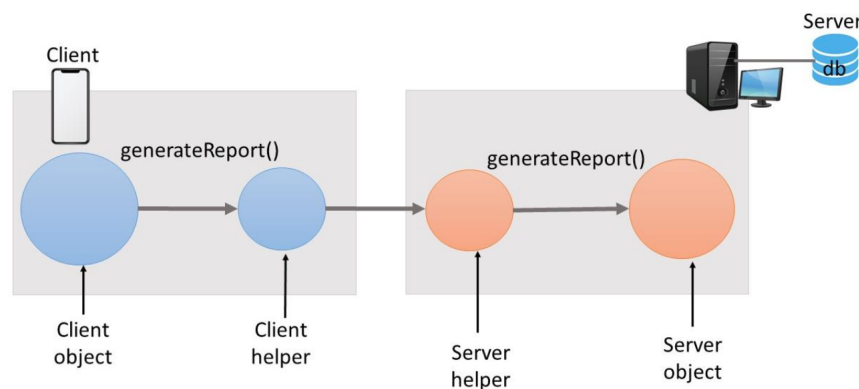
- (d). Explain the scenario where the **Remote Method Invocation (RMI)** is required in enterprise application development.

[6 marks]

Write a code that invoking a method on a local object and invoke a method on remote object (Object in a different heap) Topic 2 - Page 11

- (e). Using a proper diagram, illustrate the **Remote Method Invocation (RMI)** process by clearly labelling all the critical components involved.

[16 marks]



function name can be any valid name. Topic 2 Page 14/15

- (f). Identify the **two (2)** parameters required to configure a servlet mapping within a **deployment descriptor**.

[6 marks]

`< servlet - name >` - Variable name that links the actual servlet class with the URL mapping

`< url - pattern >` - The mapping we want when attempting to invoke the servlet.

Topic 7 - Page 43

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2. (a). What is an **application server**?

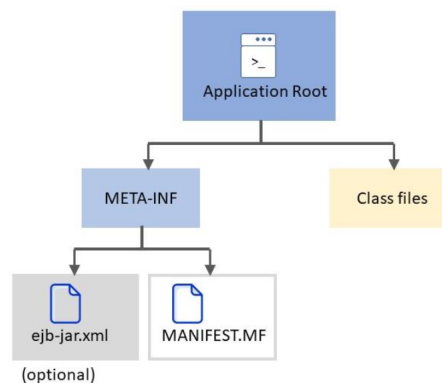
[8 marks]

An application server is a software component that provides the necessary runtime environment and infrastructure to host and manage Java EE enterprise applications. Topic 4 - Page 5

(b). Define the purpose of a **Java Archive (JAR)** file within the context of deployment. Illustrate the standard internal directory structure of an enterprise JAR file using a structural diagram.

[20 marks]

JAR files can contain Plain Old Java Object (POJO) classes, JPA Entity Beans, utility Java classes, EJBs, and MDBs.
Topic 7 Page 64



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- (c). State the mechanism used to transform a **Plain Old Java Object (POJO)** into an Enterprise JavaBeans (EJB) component.

[10 marks]

annotating the POJO with one or more annotations defined in the Java EE standard.

Running the resultant EJB in the context of an application server.

Topic 5 - Page 41

- (d). List and briefly describe the primary components that comprise the **Java Persistence API** architecture.

[12 marks]

EntityManagerFactory - This is a factory class of **EntityManager**. It creates and manages multiple **EntityManager** instances.

EntityManager - It is an Interface, it manages the persistence operations on objects. It works like factory for Query instance.

Entity - Entities are the persistence objects, stores as records in the database.

EntityTransaction - It has one-to-one relationship with **EntityManager**. For each **EntityManager**, operations are maintained by **EntityTransaction** class.

Persistence - This class contain static methods to obtain **EntityManagerFactory** instance.

Query - This interface is implemented by each JPA vendor to obtain relational objects that meet the criteria.

Topic 6 - Page 9
