

**University of M'sila,**  
**Faculty of Mathematics & Computer Science (CS),**  
**Department of CS.**

**Course: Distributed Information Systems (ISIL 3<sup>rd</sup> year)**

**Year: 2023-2024**

**Duration: 1:30**

**Final Exam**

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**Q1. (8 points)**

**Select ONE choice from the following:**

1. In RMI, the binder is used by:
  - a. The client only
  - b. The server only
  - c. Both of them**
  - d. None of the mentioned
2. The block which contains a set of statements where an exception can be handled is called:
  - a. throws
  - b. try
  - c. RemoteException
  - d. catch**
3. Hiding that a resource may be shared by several users is called:
  - a. Transparency**
  - b. Replication
  - c. Shared resource
  - d. Scalability
4. In distributed systems, services are generally specified through interfaces, which are often described in:
  - a. Interface, client, server
  - b. Interface Definition Language**
  - c. Interface Description Language
  - d. Interface Design Layer
5. It provides security services such as authentication, authorization, and encryption:
  - a. RMI
  - b. Software bus
  - c. Distributed object
  - d. CORBA**
6. It performs NO operations on HTTP requests and responses:
  - a. Proxy
  - b. Binder
  - c. Tunnel**
  - d. Cache

7. The HTTP connection is stateless. This means:
- The server and client are aware of each other only during a current request
  - The client and the browser can retain information between different request across the web pages
  - Both a and b
  - None of the mentioned
8. Java object that is hosted by a special server offering different ways for remote clients to invoke that object is:
- Object server
  - Remote object
  - Enterprise Bean
  - Transient object

**Q2. (4 points)**

Heterogeneity is considered one of the main challenges of developing a distributed system.

- What does heterogeneity mean?
- Which tool will you use to solve this challenge (RMI-CORBA-EJB)? Justify

**Definition:** Variety and differences in: • Networks. • Computer hardware. • Operating systems. • Programming languages implementations by different developers.

**Solution:** Middleware as a software layer to provide a programming abstraction as well as masking the heterogeneity of the underlying networks, hardware, OS, and programming languages (e.g., CORBA).

**Q3. (8 points)**

Write a **distributed application** that calculates any power of any number specified both by the client, e.g.,  $5^4$ . **Do not use pow!**