IMPORTANT: The following document contains the structure of an exam on Distributed Systems. It contains partly tasks, partly notes on the topics covered. Correctness is not guaranteed.

1. Is the following a Distributed System?

   a) 8 CPUs, numerical tasks, several processes, exchanging data via shared memory

   b) 18 PCs. Each has it's own Operating System, saving data on it's own seperate hard drive. All have their own hardware.

2. Explain two types of Transparency (The following are just two examples)

   a) What is Access Transparency?

   b) What is Migration Transparency?

3. Add the missing code lines, by choosing from different options (e.g `DatagramSocket` and `DatagramPacket`).

4. A Socket Host connects to 3 client. How many `Socket`/`DatagramSockets` Object need to be initalized with . . .

   a) TCP

   b) UDP

5. Remote Method Invocation: Which Object need to be registered in the name server? (Exact task unfortunately not found)

6. JSM Publish/Subscribe: A Server publishes 2 messages $m1$ and $m2$ without an active subscriber. A subscriber comes online. After that message $m3$ and $m4$ are published. In which order does the subscriber receive the message?

7. Servlet Code: Add the missing parts. (The information for the missing parts are given in the exam)

   a) `<action _____ >`

   b) `<input type=_____ textsize=_____ >`

8. JSP Code:

```
1 <int b = 1;>
2 <int c = 12;>
3 <!c++;>
4 <=b++;>
5 <p> Wert 1: <=b>
6 <p> Wert 2: <=c++>
```

   a) What is the output after the first execution?

   b) What is the output after the fourth execution?

9. Servlet: mechanisms to recognize clients

10. Code for a POJO class is given

    a) Is the class well-defined?

    b) Which attributes?

11. XML DTD: XML Code is given. Is it well-defined, is it valid?

12. Which language is used to formally describe webservices?

13. Explain the structure/parts of a SOAP message.

14. Timeserver: Algorithms

15. What does REST stand for?

16. What does idempotence stand for?