Databases I. Exam

Dear Students,

Here I would like to give you some important information about the exam.
Below is a list of all the exercise types that can occur in the exam.
In the exam you will get only 6 exercises.

1. Relational algebra

- You have to express a query in relational algebra for some sample data and you must run the query in relational algebra calculator (Relax).
- You must compute the result of some relational algebra expression in paper, like in db1_exercise5b.pdf (Exercise 3, Exercise 4).
- You must convert a relational algebra expression into SELECT.

2. SQL SELECT

- You have to write an SQL query and run it on some sample data.
- You have to convert a SELECT statement into relational algebra.

3. SQL DML statement

- You have to write an SQL DML statement (INSERT, DELETE, UPDATE) and run it on some sample data.

4. SQL WITH statement

- You have to write an SQL query using the WITH statement and run it on some sample data.

5. DATALOG

- You have to express a query in Datalog (in paper).
- You have to convert relational algebra into Datalog and vice versa. (See Textbook 5.4.8: Exercises)

6. Recursion in Datalog and in SQL

- You have to write a recursive query (WITH or CONNECT BY) and run it on some sample data.
- You have to write a recursive Datalog query (in paper).

7. Entity-Relationship models and DDL

- You will get an E-R model, and you have to convert it into relations, and you have to write the appropriate CREATE TABLE statements with primary key and foreign key definitions.

8. Functional Dependencies

- Compute the closure of a set of attributes. (See Algorithm 3.7 and Example 3.8 in Textbook)
- Decide if a Functional Dependency follows from some other FD's. (See Example 3.9)
- Find the keys of a relation. (Like Exercise 3.2.1 in Textbook)

- Compute a minimal basis for a set of Functional Dependencies.
- Compute the projection of a set of FD's. (Alg. 3.12, Example 3.13, Exercise 3.2.10)

9. Normal Forms, decomposition

- Decompose a relation into relations which are in Boyce-Codd Normal Form.
  (Alg. 3.20, Exercise 3.3.1)
- Test if a decomposition is a Lossless Join decomposition -> Chase Test.
  (Example 3.22, Example 3.23, Example 3.24, Exercise 3.4.1)