可以中文作答

1. What are the definitions of the 1st Normal Form, 2nd Normal Form, and 3rd Normal Form in Relational Database? (10%)

2. Please design a database (logical level design using Relational Database) for a DVD rental store. There are a few entities the store wants to keep track of: Customer, DVD, Inventory, and Employee.
   The followings are the requirements of the DVD rental store.
   1. A customer can rent "many" DVDs.
   2. An employee can serve "many" customers.
   3. There are many warehouses storing DVDs.
   4. The "on-hand" (total quantity left) information of certain DVD must be provided in the database.

   Please show **a. the E-R Diagram; and b. the tables in 3rd NF**. Note that you may make your own assumptions to solve the question as long as you specify them. Otherwise, it shall be a good common-sense requirement. It is up to you to assign whatever attributes you like to each entity. When you list tables, please use the following expression. (30%)

   Table Name (<u>PrimaryKey</u>, column name2, column name 3, …etc.)

3. What are the possible troubles/inefficiencies caused by Mobile IP? (10%)

4. What is pipelining? How to deal with the "hazards" caused by pipelining? (10%)

5. Please complete the following Truth Table. (10%)

A	B	AND output	OR output	XOR output	NAND output
0	0				
0	1				
1	0				
1	1				

6. How does the sliding window work on OSI 2nd layer and 4th layer? How do they differ? (10%)

7. Describe how Virtual Machine works. (10%)

8. Why is "Buffer Overflow" an easy target to hackers? (10%)