

# ISE 305 DATABASE SYSTEMS

# FINAL EXAM

120 MINUTES

May 26, 2006

Name: \_\_\_\_\_

Number: \_\_\_\_\_

Signature: \_\_\_\_\_

1a	1b	1c	1d	2	3a	3b	Total
/25	/15	/15	/10	/15	/10	/10	/100

1. Consider the database of a bookstore with the following tables:

Books(isbn:CHAR(10), title:CHAR(8), author: CHAR(80), qty\_in\_stock: INTEGER, price: REAL, year\_published: INTEGER)

Customers(cid: INTEGER, cname: CHAR(80), address: CHAR(200), city: CHAR(10))

Orders(ordernum: INTEGER, isbn: CHAR(10), cid: INTEGER, cardnum: CHAR(16), qty: INTEGER, order\_date: DATE, ship\_date: DATE)

An order is given by a customer on the same day. Customers should be able to purchase several different books in a single order. The copies of the different books may be shipped on different days, but the copies of the same book are shipped on the same day.

- (a) Are these relations in Third Normal Form? If not, decompose them to a minimal number of 3NF relations.

- (b) Write the SQL statements to create the tables.

(c) Draw the ER diagram that reflects this design.

- (d) Complete the following java application to print out a list of the customers who are living in Istanbul. Assume the giving string variables are defined correctly.

```
import java.sql.*;

public class IstanbulResidentList
{
    public static void main(String[] argv)
    {
        String username = "storeuser";
        String password = "storepw";
        String driverClass = "org.postgresql.Driver";
        String url = "jdbc:postgresql:bookstore");
WRITE THE CODE THAT GOES HERE
    }
}
```

2. Explain the usage of the log during the execution of a transaction. What information is recorded in the log (be precise!)? Give a scenario where the log is used?

3. Assume the following transaction T. Before the transaction T starts the object A has the value 100.

Time	Operation
1	read(A)
3	$A := A + 100$
5	write(A)
7	read(B)
9	write(B)
11	commit

- (a) Assume another transaction T' wants to read the object A at time point 4. What value for A does T' get?
- (b) Assume a system crash at time point 9. After system restart what is the value for A? Explain briefly.