

ISE 305 DATABASE SYSTEMS

MIDTERM EXAM #1

90 MINUTES

MARCH 17, 2006

Name: _____

Number: _____

Signature: _____

1	2	3	4	5	6	7	8	Total
/20	/15	/10	/20	/10	/10	/5	/10	/100

The following schema is used in all of the questions on this exam.

Suppliers(*sid*:integer, *sname*: string, *address*: string)

Parts(*pid*:integer, *pname*: string, *stockLevel*: integer, *color*: string)

Catalog(*sid*:integer, *pid*:integer, *unitPrice*: real)

Order(*oid*:integer, *sid*:integer, *pid*: integer, *quantity*: integer)

In the schema, the primary key of each relation is underlined, and the domain of each field is listed after the field name. The schema describes suppliers, parts and orders placed to the suppliers for parts. The *Catalog* table lists the prices charged for parts by suppliers. Its *sid* attribute is a foreign key into the *Suppliers* table, indicating to which supplier the order is placed. Also, *pid* is a foreign key into the *Parts* table. Each order gives information about a particular part that is included in the order. In the order table, *sid* is a foreign key into the *Suppliers* table and *pid* is a foreign key into the *Parts* table.

1. (20 marks) Write the SQL statements required to create the tables, including appropriate primary and foreign key integrity constraints.

2. (15 marks) Write the SQL statement to find the supplier names (*names*) who supply some red part.

3. (*10 marks*) Define the *Order* table in SQL so that every order is quaranted to have a part identifier (*pid*) and a quantity greater then 0.

4. (*20 marks*) Write an SQL query that will return the supplier identifier, supplier name and the total order value for each supplier that has a total order value at least 100.00. The value of each order is the quantity times the part's unit price charged by that supplier. The total order value for a supplier is the sum of the values of all of the orders placed to the supplier.

6. (10 marks) Define “foreign key constraint” and “primary key constraint”. Be brief, and be specific.

7. (5 marks) Suppose that Q1 and Q2 are union compatible SQL queries, and that for a particular database (756, Gunduz) appears five times in the result of Q1, and three times in the result of Q2. For each of the following SQL queries, indicate how many times (756, Gunduz) appear in the result, assuming that the queries are evaluated against the same database

Q1 UNION Q2
Q1 INTERSECT Q2
Q1 EXCEPT ALL Q2

8. (10 marks) Consider the following two queries.

QUERY A
SELECT oid, pid
FROM order
WHERE quantity > 100
GROUP BY oid, pid

QUERY B
SELECT oid, pid
FROM order
GROUP BY oid, pid
HAVING sum(quantity) > 100

Are these two queries equivalent? If they are, write “equivalent”. If they are not, give an instance of the Order table (consistent with the schema) for which the two queries will return different answers, and give the answer that each query will produce when applied to that instance.