CS2 Databases TEST 2
3 September 2003

Student Number:_____

Name: _____

MARK: _____/45

Instructions
- Read the questions carefully
- Answers are to be written on this sheet
- **ONLY Ink** is to be used, No Pencil. Marks will be deducted
- Marks are shown in [ ]. Max Mark : 45
- Time is 45 Minutes

Section A – Multiple Choice [10 marks]

1. Which portion of a database system contains the actual data elements, such as the name, address, or a phone number for a particular person?
Please select the best answer.
- A. Tables
- B. Fields
- C. Rows
- D. Databases

2. What's wrong with this statement?
SELECT * FROM Customers INTO NewCustomers WHERE CustomerID = 12345
Please select the best answer.
- A. You cannot use a WHERE clause with the INTO clause.
- B. You must have the INTO clause before the FROM clause
- C. You must indicate the columns to select. You cannot use *.
- D. Nothing is wrong. It will work as shown.

For the next four (4) questions, please refer to the following table, named Orders:

OrderNum	ItemNum	Date	Qty	CustID
4332	1001	12/31/97	5	0001
4332	1002	12/31/97	1	0001
4321	1001	01/10/98	1	1231
4333	1003	01/15/98	1	0002
4321	1010	01/10/98	10	1231
4334	1011	01/10/98	1	1231
4335	1231	01/15/98	1	4325

3. Which statement below will return only the OrderNum and ItemNum columns from this table?
Please select the best answer.
- A. SELECT * FROM Orders WHERE COLUMN NAMES = 'OrderNum', 'ItemNum'
- B. SELECT * FROM Orders
- C. SELECT COLUMNS OrderNum, ItemNum FROM Orders
- D. SELECT OrderNum, ItemNum FROM Orders

4. Which statement below will return only those rows where customerID=0001?
Please select the best answer.
    A. SELECT CustID=0001 FROM Orders
    B. SELECT * FROM Orders WHERE CustID=0001
    C. SELECT * FROM Orders IF CustID=0001
    D. SELECT * FROM Orders ORDER BY CustID=0001

5. Which statement below will extract the OrderNum and ItemNum columns and place them into a new table, new_Orders?
Please select the best answer.
    A. SELECT OrderNum AND ItemNUm FROM Orders INTO new_Orders
    B. SELECT INTO new_Orders COLUMNS OrderNum, ItemNum FROM Orders
    C. SELECT OrderNum, ItemNum INTO new_Orders FROM Orders
    D. SELECT OrderNum, ItemNum INTO new_Orders

6. Select all rows and columns from the table, sorted by quantity. Make sure that the most significant line item, the one with the largest value, is at the top of the list, and those with smaller values come last. Which statement below will accomplish this?
Please select the best answer.
    A. SELECT * FROM Orders ORDER BY QTY
    B. SELECT * FROM Orders ORDER BY QTY DESC
    C. SELECT * FROM Orders SORT BY QTY DESC
    D. SELECT * FROM Orders DESC ORDER BY QTY

7. You need to make a change to an existing row in the table. Which statement will you use?
Please select the best answer.
    A. UPDATE
    B. CHANGE
    C. DELETE then INSERT a new row
    D. MODIFY

8. What's wrong with the statement shown below?
INSERT INTO BasicTable(Lastname, Firstname) Values ("xxxx", "xxxx")
Please select the best answer.
    A. The table name is not in the correct location.
    B. The values should be provided before the column names.
    C. The column names are not listed first, followed by values and the table name.
    D. Nothing is wrong with the statement.

9. What benefits do indexes provide for your queries?
Please select all the correct answers.
    A. Faster query times
    B. Sorting
    C. Better use of the database engine (less work in retrieving your results)
    D. The database engine will not return the rows in order without indexing.

10. Which of the following statements are true?
Please select all the correct answers.
    A. Flat file database systems pay more attention to retrieving data and making it accessible to the user, whereas relational databases spend more energy updating indexes and data pointers.
    B. Relational database systems are the main thrust behind SQL since it provides the language elements needed to tie together the information in the database.
    C. Relational systems pay more attention to retrieving data and making it accessible to the user.
    D. In non-relational databases, the information is stored at random and retrieved in an organized manner.

Section B – Short Answer [35 Marks]

Question 1 [9]

A database is to be set up to record information about manufacturing a specific product. Data about the following are to be recorded: the machines, setup times, production times and name and amount of each ingredient used in manufacturing each specific product.

Three machines and two ingredients are used in any one product (in other words, three machines are used per product; two ingredients are used per product). The attributes identified by a system analyst are presented below:

```
PRODNUM    Product number (unique)
DESC       Product description

MACNUM1    Id-Number of first machine used
SETUP1     Setup time for first machine
PRORATE1   Production time for first machine

MACNUM2    Id-Number of second machine used
SETUP2     Setup time for second machine
PRORATE2   Production time for second machine

MACNUM3    Id-Number of third machine used
SETUP3     Setup time for third machine
PRORATE3   Production time for third machine

IGD1       Id-Number of first ingredient used
AMT1       Amount of first ingredient used

IGD2       Id-Number of second ingredient used
AMT2       Amount of second ingredient used

The dependencies are:

PRODNUM, MACNUM --> SETUP
PRODNUM, MACNUM --> PRORATE
PRODNUM         --> DESC
PRODNUM, IGD    --> AMT
```

The universal relation appears as follows: Products(Prodnum,Desc,Macnum,Setup,Prorate,Igd,A mt). Place this data into 3rd normal form, explaining your reasoning for each step.

Question 2 [2]
Here are two tables, Product_Table and Vendor_Table, which form part of a database.
Is there an integrity problem here, and if so, what? Explain your answer.

```
Product_table
Prod_Code   Prod_Desc    Prod_Price    Prod_on_Hand    Vend_Code
001278-AB   Claw Hammer    12.95            23            282
123-21UUY   Chain Saw     189.99            4             285
QER-34256   Sledge Hammer  18.63            6             281
SRE-657UG   Rat-tail file   2.99           15             282
ZZX3245-Q   Steel Tape      6.79            8             285

Vendor_table
Vend_Code   Vend_Contact           Vend_Areacode    Vend_Phone
230         Shelly K. Smithson         608           555-1234
231         James Johnson              615           123-4536
232         Annelise Crystal           608           224-2134
233         Candice Wallace            904           342-6567
234         Arthur Jones               615           123-3324
235         Henry Ortozo               615           899-3425
```

Question 3 [2,2]
a) Create statement that can be used to create a new table named Products. The following information is required to be stored in the table:

| 78896 | ACME Super soaker | Green left hand watering cans |

Bear in Mind that you should aim to ensure referential integrity

b) What statements will be required to create an index on the Product ID column and drop the same?

Question 4 [1,1]

ID	LastName	FirstName	Address	City	State	ZipCode	Phone
1	Brennan	Caitlin	1604 N West Street Suite 304 -D	Santa Clara	CA	99834-1223	(444) 515-1212
2	Anne	Julie	3561 E.Chof Ovi St.	Tucson	AZ	AZ 85700	(444) 515-1212
3	Nahk	Tabinda	12 S.Main Street	Seattle	WA	12345	(444) 515-1212
4	Steinbern	Mike	5481 SE Torque Blvd	San Antonio	TX	95700-3346	(444) 515-1212
5	Mhazi	Stephen	One DigitalThink Way	Los Angeles	CA	85321	(444) 515-1212

a) Produce a SQL statement that will change the city and province for the customer with the last name of Mhazi and customer ID of 5, to Trenton and NJ, respectively.
b) Create a DELETE statement that will remove the row containing the record for Tabinda Nahk, which is associated with Customer ID 3.

Question 5 [2]
Discuss the differences between data and information?

Question 6 [1,4]
a) What does the Acronym DBLC mean and what does it represent
b) Briefly discuss the components of a DBLC?

Question 7 [4]
List and briefly discuss the properties a Transaction should satisfy

Question 8 [3]
E-Commerce IT solutions can be highly involved, and complicated. However the E-commerce solution can be broken down into three primary classes of components. Name the three classes, giving an example each, and detailing how it relates to the other classes.

Question 9 [1,2,1]
Database backups are important
    a) How would you back up a postgreSQL database, with and without compression
    b) What advantages would this method provide over a filsystem level backup
    c) Which of the above backup methods is likely to be smaller, and why?