CS 34800 Homework 1

Deadline for returning the HW: Friday January 27th, 2012 at the end of the CS 34800 class.
Instructions. Print the homework and mark the replies on the homework.
Return the hard copy of the homework marked with the replies to the instructor at the end of the class.

1. Which of the following uses canned transactions?
   a) The DBA makes changes to the database using specialized programs.
   b) A software engineer develops concurrency module for DBMS.
   c) A clerk at the grades office enters grades and prints out transcripts using a GUI.
   d) A database operator performs routine checks on the database.

2. Why is a database approach more efficient than file processing?
   a) A database approach has very low initial investment.
   b) A database approach helps in eliminating redundancy.
   c) A DBMS has lower overheads than a file system.
   d) All of the above.

3. A mail order database has the following Conceptual Schemas:
   Employees (Eno,Ename,Zip,HDate)
   Parts(Pno,Pname,Price)
   Customers(Cno,Cname,Street,Zip,Phone)
   Orders(Ono,Cno,Eno,Received,Shipped)
   Odetails(Ono,Pno,Qty)
   ZipCodes(Zip,City)

   and has the following External View Schemas:
   Order_Report(Ono,Cno,Eno,Total Price)

   Consider the following statements
   a) Adding a column Zip to the Orders schema to keep track of the zip code of each order does not affect the schema of Order_Report.
   b) To improve query processing, a new index was created on the column Cno of Orders table.

   Which of these statements represent logical data independence?
   1. Both a and b
   2. a
   3. b

   Which of these statements represent physical data independence?
   1. Both a and b
   2. a
   3. b

4. Consider the mail order database described in question (3) above. Which of the following is an example of controlled redundancy?
   a) Adding a column Ono to the Employees table.
   b) Adding a column Ono to the Employees table and making sure that the Ono value in an Employee record matches a value in the Ono column in the Orders table.

c) Removing the column HDate from the Employees table.
d) Both a and b.

5. Consider the mail order database described in question (3) above. Assume that there is a web based interface used to search orders. When you search for an order using the search box, the search key word is forwarded by your local machine to a web server which then passes the request to a database server and the order is retrieved from the database. Which of the following architectures is a closest match to this design?
   a) Single tier client/server.
   b) Two tier client/server.
   c) Three tier client/server.

6. Consider the following schema for an investment portfolio database
   a) Member (MemberId, Password,FName,LName)
      Security (SId,SName, CurrentPrice, AskPrice,BidPrice)
      Transaction (MemberId, SId, Tdate, Ttype,Qty,Price)

   b) Member_Transaction(MemberId,Fname,LName,Tdate,Type,Qty,Price) seen by Members and Administrators
      Member_Password(MemberId,Password) seen only by Members

   c) Data_Layout(Table_Name,Data_Item_Name, Starting_Position,Length_In_Bytes)

   Which of the above schemas is an Internal Schema?
   1. a)
   2. b)
   3. c)
   4. all of the above

   Which of the above schemas is a Conceptual Schema?
   1. a)
   2. b)
   3. c)
   4. all of the above

   Which of the above schemas is an External Schema?
   1. a)
   2. b)
   3. c)
   4. all of the above

7. Consider a database state of the mail order database given in question (3) above.

Employees

ENO	ENAME	ZIP	HDATE
1000	Jones	67226	12/12/75
1001	Smith	60606	01/07/97
1002	Browm	50302	01/08/05

Customers

Cno	Cname	Street	Zip	Phone
1111	Charles	123 Main St.	67226	316-636-5555
2222	Bertram	237 Ash Ave.	67226	316-689-5555
3333	Barbara	111 Inwood St.	60606	316-111-1234

Orders

Ono	Cno	Eno	Received	Shipped
1020	1111	1000	12/10/05	12/12/05
1021	1111	1000	09/13/06	09/15/06
1022	2222	1001	10/12/06	10/16/06
1023	3333	1000	07/20/07	07/30/07

Eno is the primary key for Employees table.
Cno is the primary key for Customers table.
Ono is the primary key for Orders table. Also Cno and Eno columns of Orders table are foreign keys referencing Customers table and Employees table respectively.

Consider the operation Insert<'1024','4444','1000','08/20/08','08/22/08'> into Orders.
Which of the following constraints are violated?

a) Entity Integrity Constraint
b) Referential Integrity Constraint
c) Primary Key Integrity Constraint
d) All of the above

Consider the operation Insert<'1023','2222','1000','08/20/08','08/22/08'> into Orders.
Which of the following constraints are violated?

a) Entity Integrity Constraint
b) Referential Integrity Constraint
c) Primary Key Integrity Constraint
d) All of the above

8. Consider the database state and primary and foreign key constraints mentioned in question (7) above.

Consider the operation Insert<'1025','3333','1003','08/20/09','08/22/09'> into Orders.
Which of the following constraints are violated?

a) Entity Integrity Constraint
b) Referential Integrity Constraint
c) Primary Key Integrity Constraint
d) All of the above

Consider the operation Insert<NULL,'2222','1000','08/20/10','08/22/10'> into Orders.
Which of the following constraints are violated?

a) Entity Integrity Constraint
b) Referential Integrity Constraint
c) Primary Key Integrity Constraint
d) All of the above

9. Consider the mail order database schema given in question (3) above
Employees (Eno,Ename,Zip,HDate)
Parts(Pno,Pname,Price)
Customers(Cno,Cname,Street,Zip,Phone)
Orders(Ono,Cno,Eno,Received,Shipped)
Odetails(Ono,Pno,Qty)
ZipCodes(Zip,City)

Consider the Employees table. Assume that each employee can be uniquely identified by his name and HDate. That is, no two employees with the same name are hired on the same date and this will be the case in the future also. Also each employee is given a unique Eno when he joins. That is no two employees can have the same Eno now or in the future.

The candidate keys for the table are
a) (Ename,Hdate)
b) (Eno)
c) (Ename,Hdate,Zip)
d) all of the above
e) both a and b

10. Consider the mail order database schema given in question (3) above.
Employees (Eno,Ename,Zip,HDate)
Parts(Pno,Pname,Price)
Customers(Cno,Cname,Street,Zip,Phone)
Orders(Ono,Cno,Eno,Received,Shipped)
Odetails(Ono,Pno,Qty)
ZipCodes(Zip,City)

Consider the Customers table. Assume that each customer can be uniquely identified by his Cname, Street and Zip. That is no two customers with the same name live in the same street with the same zipcode and this will be the case in the future also. Also each customer is given a unique Cno when he joins. That is no two customers can have the same Cno now or in the future.

The superkeys for the table are
a) (Cno,Phone)
b) (Cname,Street,Zip)
c) (Cno,Cname,Street,Zip,Phone)
d) all of the above
e) both a and b