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Course Name	:	Database and Information Systems		Exam	:	Final Exam
Course Code	:	CSE 226		Examiner	:	Dr. Ahmed Shehata

Q1:Write True or False for each of the following Statements: (10 Marks)

1. A table can have more than one primary key column.
2. A SQL query can contain a HAVING clause only if it has a GROUP BY clause
3. Not all attributes used in the GROUP BY clause need to appear
4. In a row of a relational table, an attribute can have more than one value
5. Check constraints defines a condition that each row must satisfy
6. A composite key is a primary key that consists of more than one column
7. MODIFY DATABASE command is used to change the structural design of a table
8. ROLLBACK command is used to undo all changes made by transaction.
9. Group functions work across many rows to produce one result.
10. Commit is used to make the transaction permanent in the database

Q2: Complete the following statements: (10 Marks)

1. A/An ………………… is an object in the real world that share the same properties.
2. The …………… keyword excludes duplicate values from the aggregate value calculation.
3. To Add, Drop or Modify a column we use ……………… statement.
4. The multiple row operators are ……, ………, or……..that are used with multiple row subqueries.
5. ……………… data type contains variable length character data.
6. Two types of Relational Query languages are: ………………and ………………
7. The ………………command is used to undo last DML operations.
8. The ………………function is used to return the number of rows in a table
9. Suppose r1=(A, B) and r2=(C,D) are two relation schemas. B in r1 is a foreign key that refers to C in r2. Then the output of : $\Pi_B (r1) - \Pi_C (r2) = $ ………………
10. Clause that used to allow deletion in the parent table and deletion of the dependent rows in the child table is ………………

Q3: Select the best answer: (10 Marks)

1. The relational model is based on the concept that data is organized and stored in two-dimensional tables called …………………………
   A. Fields
   B. Records
   C. Relations
   D. Keys
2. In an ER model, ……………. is described in the database by storing its data.
   A. Entity
   B. Attribute
   C. Relationship
   D. Notation

3. A ....allows to make copies of the database periodically to help in the cases of crashes.
   A. Recovery utility
   B. Backup Utility
   C. Monitoring utility
   D. Data loading utility
4. ....specifies a search condition for a group or an aggregate.
   A. GROUP BY Clause
   B. HAVING Clause
   C. FROM Clause
   D. WHERE Clause
5. Clause used in SQL for ensuring referential integrity is classified as ....
   A. PRIMARY KEY clause
   B. SECONDARY KEY clause
   C. FOREIGN KEY clause
   D. INTERVAL KEY clause
6. Which statements are DCL(Data Controll Language) statement:
   A. Commit
   B. Revoke
   C. Grand
   D. Rollback
7. Which SQL statement is used to add new row in a database?
   A. INSERT INTO
   B. ADD NEW
   C. ADD RECORD
   D. Alter Table
8. .... command can be used to modify a column in a table
   A. alter
   B. update
   C. set
   D. create
9. In the case of entity integrity, the primary key may be......
   A. not Null
   B. Null
   C. both Null and not Null
   D. any value
10. Drop Table cannot be used to drop a table referenced by a .... constraint.
    A. Local Key
    B. Primary Key
    C. Composite Key
    D.Foreign Key

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Q4: Consider the following three Tables A, B, and C: (6 Marks)

Table A			Table B			Table C		
Id	Name	Age	Id	Name	Age	Id	Phone	Area
---	---	---	---	---	---	---	---	---
12	Arun	60	15	Shreya	24	10	2200	02
15	Shreya	24	25	Hari	40	99	2100	01
99	Rohit	11	98	Rohit	20			
			99	Rohit	11			

- Write a SQL query to find the phone and area for persons who has Id equal to Id of person who has age =11 in table B   (3 Marks)
- Draw the output of the following SQL query   (3 Marks)

   SELECT A.id, A.Name, Age
   FROM   A
   WHERE A.age> ALL (SELECT B.age
            FROM   B
   WHERE B.name = "Rohit")

Q5: According to the following table instance charts: (18 Marks)

Column name	Id	Name	salary
Key Type	Primary key		
Null/Unique/ Check		Not Null	>2000
FK Table			
FK column			
Data Type	Number	Varchar2	Number
Size	3	15	(5,2)

Table q1

Column name	SNN	Dname	Phone	qid
Key Type	Primary key			Foreign key
Null/Uniq/ Check				
FK Table				q1
FK column				Id
Data Type	Number	Char	Number	Number
Size	3	5	8	3

Table q2

a. Write SQL statements to create q1 and q2 tables.   (4 Marks)
b. Assume the following sample of data in q1 and q2. Write statements to insert data in the two tables   (2 Marks)

Id	Name	Salary
10	Aly	2400
20	Majid	4000

q1

SNN	Dname	Phone	Qid
300	Comp.	1010999	10
400	Phys.	1123399	10
500	Chem.	1178399	20

q2

c. Display the data in two tables.   (2 Marks)

Check constraint violation and write correct DML to:

d. Add record (30,'kkkk',1800) in table q1.   (2 Marks)
e. Remove the first row in table q2.   (2 Marks)
f. Remove the last row in table q1.   (2 Marks)
g. Add record (600,'wwwww',123456,40) in table q2.   (2 Marks)
h. Display the Dname, phone numbers for persons who has qid equal to id for who gets salary >3000.   (2 Marks)

Q6:Consider the following tables (6 Marks)

```
student                 enrolledIn              subject
  id  |  name             id   |  code           code  |  lecturer
-----------------       --------------------    ------------------------
 1234 |  joe             1234  |  cs1500         cs1500 |  curtis
 4000 |  hector          1234  |  cs1200         cs2001 |  dave
 2000 |  ling            1234  |  cs2001         cs3010 |  curtis
                         4000  |  cs3010         cs2001 |  olivier
                         4000  |  ma3000         ma3000 |  roger
```

Id is a primary key in student table, and foreign key in enrolledin table. Code is a primary key in subject table and foreign key in enrolledin table.

Write the following queries in the relational <u>algebra</u> using the relational schema

    a.Who teaches cs1500 or cs3020? (2 Marks)
    b. What are the names of all the students in cs1500? (2 Marks)
    c.To obtain the following table (2 Marks)

```
id | name | id | code
------------------------------------------
1234 | joe | 1234 | cs1500
1234 | joe | 1234 | cs1200
1234 | joe | 1234 | cs2001
1234 | joe | 4000 | cs3010
1234 | joe | 4000 | ma3000
```