

Review Test Submission: Exam-2

Userng
Course	CS 6360.001 - Database Design - S21
Test	Exam-2
Startedng
Submittedng
Due Date	4/12/21 1:00 PM
Status	Completed
Attempt Score	100 out of 100 points
Time Elapsedng 1 hour and 15 minutes
Results Displayed	Submitted Answers, Correct Answers

Question 1

4 out of 4 points

Find the correct SQL statement(s) for following query. **(check all that apply)**

Query: List names of all department managers who have no dependents.

Use COMPANY Database Schema below.

Employee (FName, LName, SSN, BDate, Address, Gender, Salary, SuperSSN, DNo)

Department (DName, DNo, MgrSSN, MgrStartDate)

Project(PName, PNo, PLocation, DNo)

Works_On (SSN, PNo, Hours)

Dept_Location (Dno, DLocation)

Dependent (Essn, Dependent_name, Gender, Bdate, Relationship)

Selected ☒

Answers:
 SELECT FName, Lname
 FROM Department D, Employee E
 WHERE D.MgrSSN=E.SSN AND D.MgrSSN NOT IN (SELECT Essn FROM
 Dependent)



SELECT Fname, Lname

FROM Department D, Employee E

WHERE D.MgrSSN=E.SSN AND NOT EXISTS (SELECT * FROM Dependent
WHERE Essn=MgrSSN)

Correct



Answers:

SELECT Fname, Lname

FROM Department D, Employee E

WHERE D.MgrSSN=E.SSN AND D.MgrSSN NOT IN (SELECT Essn FROM
Dependent)



SELECT Fname, Lname

FROM Department D, Employee E

WHERE D.MgrSSN=E.SSN AND NOT EXISTS (SELECT * FROM Dependent
WHERE Essn=MgrSSN)

Question 2

4 out of 4 points

Based on following database schema, which SQL statement is correct?

STUDENT

Name	Student_number	Class	Major
------	----------------	-------	-------

COURSE

Course_name	Course_number	Credit_hours	Department
-------------	---------------	--------------	------------

PREREQUISITE

Course_number	Prerequisite_number
---------------	---------------------

SECTION

Section_identifier	Course_number	Semester	Year	Instructor
--------------------	---------------	----------	------	------------

GRADE_REPORT

Student_number	Section_identifier	Grade
----------------	--------------------	-------

Selected



Answer:

INSERT INTO COURSE(Course_name, Course_number, Credit_hours) VALUES
('Knowledge Engineering', 'CS4390', 3)

Correct



Answer:

INSERT INTO COURSE(Course_name, Course_number, Credit_hours) VALUES
('Knowledge Engineering', 'CS4390', 3)

Question 3


4 out of 4 points


Find the error in below PL/SQL code.

Use following database schema and assume there are more than one employee within each

department.
Employees(employee_id, first_name, last_name, department_id)
Departments(department_id, department_name)

```
1 DECLARE
2   l_last_name employees.last_name%TYPE;
3   l_department_name departments.department_name%TYPE;
4 BEGIN
5   SELECT last_name, department_name
6   INTO l_last_name, l_department_name
7   FROM employees e, departments d
8   WHERE e.department_id=d.department_id
9   AND e.department_id=13;
10  DBMS_OUTPUT.put_line (l_last_name || ' in ' || l_department_name);
11 END;
```

Selected 
Answer: Line 5: SELECT query will return multiple tuples, thus we cannot use SELECT INTO.
We will need to define an explicit cursor for handling the results.

Correct 
Answer: Line 5: SELECT query will return multiple tuples, thus we cannot use SELECT INTO.
We will need to define an explicit cursor for handling the results.

Question 4

4 out of 4 points


Consider the following relation:


CAR_SALE(Car#, Date_sold, Salesperson#, Commission%, Discount_amt)

Assume that a car may be sold by multiple salespeople, and hence {Car#, Salesperson#} is the primary key. Additional dependencies are

Date_sold → Discount_amt
Salesperson# → Commission%

What normal form is the relation in?

Selected Answer:  1NF

Correct Answer:  1NF


Question 5


4 out of 4 points

Consider the following relation:

TRIP (Trip_id, Start_date, Cities_visited, Cards_used)

This relation refers to business trips made by company salespeople. Suppose the TRIP has a single start-date but involves many cities and salespeople may use multiple credit cards on the trip. What normal form is the relation in?

Selected Answer:  not 1NF

Correct Answer:  not 1NF

Question 6

4 out of 4 points

Find the correct SQL statement for the query given below using the following database schema:

STUDENT

Name	Student_number	Class	Major
------	----------------	-------	-------

COURSE

Course_name	Course_number	Credit_hours	Department
-------------	---------------	--------------	------------

PREREQUISITE

Course_number	Prerequisite_number
---------------	---------------------

SECTION

Section_identifier	Course_number	Semester	Year	Instructor
--------------------	---------------	----------	------	------------

GRADE_REPORT

Student_number	Section_identifier	Grade
----------------	--------------------	-------

Query: For each section taught by Professor King, retrieve the course number, semester, year and number of students who took the section.

Selected 

Answer: SELECT CourseNumber, Semester, Year, COUNT(*) FROM SECTION, GRADE_REPORT WHERE Instructor='King' AND SECTION.SectionIdentifier=GRADE_REPORT.SectionIdentifier GROUP BY CourseNumber, Semester, Year

Correct 

Answer: SELECT CourseNumber, Semester, Year, COUNT(*) FROM SECTION, GRADE_REPORT WHERE Instructor='King' AND SECTION.SectionIdentifier=GRADE_REPORT.SectionIdentifier GROUP BY CourseNumber, Semester, Year

Question 7


4 out of 4 points

Regarding below table, assume that each employee can have only one name and one address. A city can have many zip codes. A zip code belongs to only one city.

<u>Emp. ID</u>	Name	Zip	City
99	Susan	75045	Commerce
33	James	75201	Dallas

44	Jerry	75201	Dallas
11	Susan	77010	Houston
66	Katryn	75044	Commerce

Based on these assumptions, check if the table is in 3NF or not.

Selected 

Answer: No, it does not satisfy 3NF because City functionally depends on Zip.

Correct Answer: 

No, it does not satisfy 3NF because City functionally depends on Zip.

Question 8

4 out of 4 points

Which statement is FALSE regarding procedures in PL/SQL?

Selected 

Answer: Inside the subprogram, an OUT parameter acts like a variable. You can change its value and its value is only accessible to the subprogram itself.

Correct 

Answer: Inside the subprogram, an OUT parameter acts like a variable. You can change its value and its value is only accessible to the subprogram itself.


Question 9


4 out of 4 points

Consider the following relation state.

A	B	C
10	b4	c1
10	b2	c2
11	b4	c1
12	b3	c4
13	b2	c3
14	b3	c4

Which of the following dependencies may hold in the above relation?

Selected Answer:  $C \rightarrow B$

Correct Answer:  $C \rightarrow B$

Question 10

4 out of 4 points

Consider the following relation:

R (Doctor#, Patient#, Diagnosis, Treat_code, Charge)

In this relation, a tuple describes a visit of a patient to a doctor along with a treatment code and daily charge. Assume that each treatment code has a fixed charge. Is this relation in 3NF? If not, which option shows the correct decomposition?

Selected Answer: R1 (Doctor#, Patient#, Diagnosis, Treat_code)
R2 (Treat_code, Charge)



Correct Answer: R1 (Doctor#, Patient#, Diagnosis, Treat_code)
R2 (Treat_code, Charge)



Question 11

4 out of 4 points

Consider the relation DiskDrive(serialNumber, manufacturer, model, batch, capacity, retailer).

Based on following information, which option does NOT show a valid functional dependency?

- a. The manufacturer and serial number uniquely identifies the disk drive.
- b. A model number is registered by a manufacturer and hence can't be used by another manufacturer.
- c. All disk drives in a particular batch are the same model.
- d. All disk drives of a particular model of a particular manufacturer have exactly the same capacity.


Selected Answer:  model -> batch


Correct Answer:  model -> batch

Question 12

4 out of 4 points

Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies F = { {A, B} -> {C}, {A} -> {D, E}, {B} -> {F}, {F} -> {G, H}, {D} -> {I, J} }. Which option shows the correct decomposition of relation R into 3NF (use traditional successive normalization)?

Selected Answer: R1 = {D, I, J}, R2 = {A, D, E}
R3 = {F, G, H}, R4 = {B, F}
 R5 = {A, B, C}

Correct Answer: R1 = {D, I, J}, R2 = {A, D, E}
R3 = {F, G, H}, R4 = {B, F}
 R5 = {A, B, C}

Question 13

4 out of 4 points


Consider the relation R, which has attributes that hold schedules of courses and sections at a university; $R = \{\text{CourseNo}, \text{SecNo}, \text{OfferingDept}, \text{CreditHours}, \text{CourseLevel}, \text{InstructorSSN}, \text{Semester}, \text{Year}, \text{Days_Hours}, \text{RoomNo}, \text{NoOfStudents}\}$.

Suppose that the following functional dependencies hold on R:

$\text{CourseNo} \rightarrow \{\text{OfferingDept}, \text{CreditHours}, \text{CourseLevel}\}$
 $\{\text{CourseNo}, \text{SecNo}, \text{Semester}, \text{Year}\} \rightarrow \{\text{Days_Hours}, \text{RoomNo}, \text{NoOfStudents}, \text{InstructorSSN}\}$
 $\{\text{RoomNo}, \text{Days_Hours}, \text{Semester}, \text{Year}\} \rightarrow \{\text{InstructorSSN}, \text{CourseNo}, \text{SecNo}\}$

Which set of attributes is a candidate key for relation R?

Selected Answer:  CourseNo, SecNo, Semester, Year

Correct Answer:  CourseNo, SecNo, Semester, Year


Question 14


4 out of 4 points

Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies

$F = \{ \{A, B\} \rightarrow \{C\}, \{B, D\} \rightarrow \{E, F\}, \{A, D\} \rightarrow \{G, H\}, \{A\} \rightarrow \{I\}, \{H\} \rightarrow \{J\} \}$.

Based on given functional dependencies, what is the primary key for R?

Selected Answer:  ABD

Correct Answer:  ABD

Question 15

4 out of 4 points

Find the error in below PL/SQL code.

Use following database schema and assume there are more than one employee within each department.

Employees(employee_id, first_name, last_name, department_id)

Departments(department_id, department_name)

```
1 DECLARE
2   l_last_name employees.last_name%TYPE;
3   l_department_name departments.department_name%TYPE;
4 BEGIN
5   SELECT *
6   INTO l_last_name, l_department_name
7   FROM employees e, departments d
8   WHERE e.department_id=d.department_id
9   AND e.employee_id=13;
```

```

10 DBMS_OUTPUT.put_line (l_last_name || ' in ' || l_department_name);
11 END;

```

Selected Answer: Line 6: The INTO list contains fewer variables than the SELECT list.



Correct Answer: Line 6: The INTO list contains fewer variables than the SELECT list.



Question 16

4 out of 4 points

Find the correct SQL statement for following query.

Query: For each department that has more than five employees, retrieve the department number and number of male employees in the department.

Use COMPANY database schema.

Employee (FName, LName, SSN, BDate, Address, Gender, Salary, SuperSSN, DNo)

Department (DName, DNo, MgrSSN, MgrStartDate)

Project(PName, PNo, PLocation, DNo)

Works On (SSN, PNo, Hours)

Selected Answer: 

Select Dno, Count(*) From Employee
Where Gender='M' AND Dno In (Select Dno From Employee Group By Dno
Having Count(*)>5) group by Dno

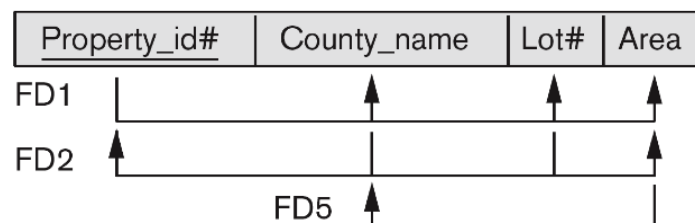
Correct Answer: 


Select Dno, Count(*) From Employee
Where Gender='M' AND Dno In (Select Dno From Employee Group By Dno
Having Count(*)>5) group by Dno


Question 17

4 out of 4 points

Based on given functional dependencies, the following relation is in:



Selected Answer:  3NF

Correct Answer:  3NF

Question 18

4 out of 4 points

Which option shows the correct SQL for following query?

Query: List the names of employees who earn maximum salaries in their respective departments.

Use COMPANY database schema.

Employee (FName, LName, SSN, BDate, Address, Gender, Salary, SuperSSN, DNo)

Department (DName, DNo, MgrSSN, MgrStartDate)

Project(PName, PNo, PLocation, DNo)

Works On (SSN, PNo, Hours)

Selected 

Answer: SELECT FName, Lname FROM Employee E1 WHERE Salary = (SELECT MAX(Salary) FROM Employee E2 WHERE E1.Dno=E2.Dno)

Correct 

Answer: SELECT FName, Lname FROM Employee E1 WHERE Salary = (SELECT MAX(Salary) FROM Employee E2 WHERE E1.Dno=E2.Dno)

Question 19

4 out of 4 points

Consider the following relation for published books:

BOOK (Book-title, Authorname, Book-type, Listprice, Author-affil, Publisher)

Suppose following dependencies exist:

Book-title -> Publisher, Book_type

Book-type -> Listprice

Authorname -> Author-affil

Show the correct decomposition of BOOK table into 3NF?

Selected Answer: R1 (Book-title, Publisher, Book-type)
R2 (Book-type, Listprice)
R3 (Author-name, Author-affil)
R4 (Book-title, Authorname)



Correct Answer: R1 (Book-title, Publisher, Book-type)
R2 (Book-type, Listprice)
R3 (Author-name, Author-affil)
R4 (Book-title, Authorname)



Question 20

4 out of 4 points

Which option shows a non-additive, dependency preserving 3NF decomposition of $R(CDEFG)$? Use minimal cover method.

R satisfies following dependencies:

$F \rightarrow G$

$D \rightarrow E$

$DC \rightarrow F$

$DE \rightarrow C$

$FG \rightarrow C$

Selected Answer: $R1(\underline{D}, E, F)$
 $R2(\underline{E}, C, G)$



Correct Answer: $R1(\underline{D}, E, F)$
 $R2(\underline{E}, C, G)$

**Question 21**

4 out of 4 points

Considering two sets of functional dependencies, F and G ,

$F = \{A \rightarrow B, B \rightarrow C, AC \rightarrow D\}$

$G = \{A \rightarrow B, B \rightarrow C, A \rightarrow D\}$

We can conclude that G is minimal cover of F .

Selected Answer: True

Correct Answer: True

Question 22

4 out of 4 points

Based on following functional dependencies, F and G ,

$F = \{A \rightarrow B, A \rightarrow C\}$

$G = \{A \rightarrow B, B \rightarrow C\}$

We can conclude that F and G are equivalent.

Selected Answer: False

Correct Answer: False

Question 23

4 out of 4 points

Consider two tables, teacher and student, and one-to-many relationship between them.

Also assume that primary key TID of teacher table appears as foreign key fkTID value in student table and the delete rule between two relations is cascade.

What happens if one deletes a row from teacher table with TID=5?

Selected Answer: All rows of student table with fkTID=5 are deleted automatically.

Correct Answer: All rows of student table with fkTID=5 are deleted automatically.

Question 24

4 out of 4 points

Which statement(s) is/are correct regarding database triggers? **(check all that apply)**

Selected 

Answers: A trigger can include SQL and PL/SQL statements to execute as a unit and can invoke stored procedures.



The session that issued the triggering statement cannot query or modify a mutating table. This restriction applies to all row triggers (triggers with FOR EACH ROW clause)



While a procedure is explicitly executed by a user, application, or trigger, one or more triggers are implicitly fired (executed) by Oracle when a triggering INSERT, UPDATE, or DELETE statement is issued.

Correct 

Answers: A trigger can include SQL and PL/SQL statements to execute as a unit and can invoke stored procedures.



The session that issued the triggering statement cannot query or modify a mutating table. This restriction applies to all row triggers (triggers with FOR EACH ROW clause)



While a procedure is explicitly executed by a user, application, or trigger, one or more triggers are implicitly fired (executed) by Oracle when a triggering INSERT, UPDATE, or DELETE statement is issued.

Question 25

4 out of 4 points

CUSTOMER


Cname	Age	Resid_City	BirthPlace
BLACK	40	ERIE	TAMPA
GREEN	25	CARY	ERIE
JONES	30	HEMET	TAMPA
MARTIN	35	HEMET	TAMPA
SIMON	22	ERIE	ERIE
VERNON	60	CARY	CARY

After execution of the following query for the CUSTOMER table, the value shown first will be:

Query:

```
SELECT Cname
FROM Customer
ORDER BY Resid_City, Cname DESC
```

Selected Answer:  VERNON

Correct Answer:  VERNON



