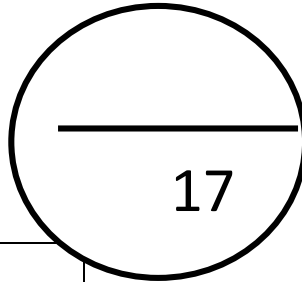Database Testbank

Quiz

Quiz 01 – 2009/2010
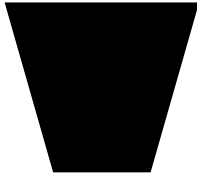
University of Jordan
King Abdullah II School for Information Technology
Computer Information Systems Department
Database Management Systems(1902321) - **Quiz #1 - Fall 2009/2010**

17

رقم الطالب:	اسم الطالب(بالعربي):
الرقم المسلسل:	رقم الشعبة:	اسم المدرس:

Circle the best answer. (1 point each)

1. *One drawback of old file systems is failure to leave database in a consistent state when partial updates carried out. This process is called*
   A. **Atomicity of updates**   B. Concurrency access   C. Security problem
   D. Data isolation   E. Data redundancy

2. *A given relation is known to be in third normal form. Select the statement which can be inferred*
   from this:
   A. All attributes contribute to the primary key
   B. Every determinant is a candidate key
   C. Each non-key attribute is determined by
   the primary key
   D. Each non-key attribute determines the primary key
   E. The relation is not in fourth normal form

3. *There are two relations X and Y. Relation X has 1 column (a) and 2 tuples, relation Y has 3 columns (b, c, d) and 4 tuples. How many records will be produced by the SQL statement:*
   ```
   SELECT a FROM X, Y.
   ```
   A. 4   B. 6   **C. 8**   D. information is not complete
           E. None of these

4. *A lack of normalization can lead to which one of the following problems*
   A. Lost Updates   B. Deletion of data   **C. Insertion problems**

D. Deferred updates   E. Deadlock

5. *To transform a relation from first normal form to second normal form we must remove which one of the following?*
   A. All partial-key dependencies   B. All inverse partial-key dependencies

   C. All repeating groups   D. All transitive dependencies   E. None of these

6. *To transform a relation from second normal form to third normal form we must remove which one of the following?*
   A. All partial-key dependencies   B. All inverse partial-key dependencies

   C. All repeating groups   **D. All transitive dependencies**   E. None of these

7. *Each of the following is an argument which might be used to support the use of relations which are not fully normalized. Select the **weakest** argument.*
   A. A fully normalized database may perform too slowly
   B. Full normalization may compromise existing applications/systems
   C. A fully normalized database may have too many tables
   D. Full normalization may make some queries too complicated
   E. A fully normalized database may result in tables which are too large

8. *Consider the relational schema R(A, B, C, D, E) with non-key functional dependencies C,D -> E and B -> C. Select the strongest statement that can be made about the schema R*
   A. R is in first normal form   B. R is in second normal form

   C. R is in third normal form   D. R is not normalized yet   E. None of the above

9. A publishing company produces academic books on various subjects. Books are written by
   authors who specialize in one or more particular subject. The company employs a number of
   editors who do not have particular specializations but who take sole responsibility for editing
   one or more publications. A publication covers a single subject area but may be written by one
   or more author - the contribution of each author is recorded as a percentage for the purposes
   of calculating royalties.

*The following ER diagram is intended to represent the above specification:*
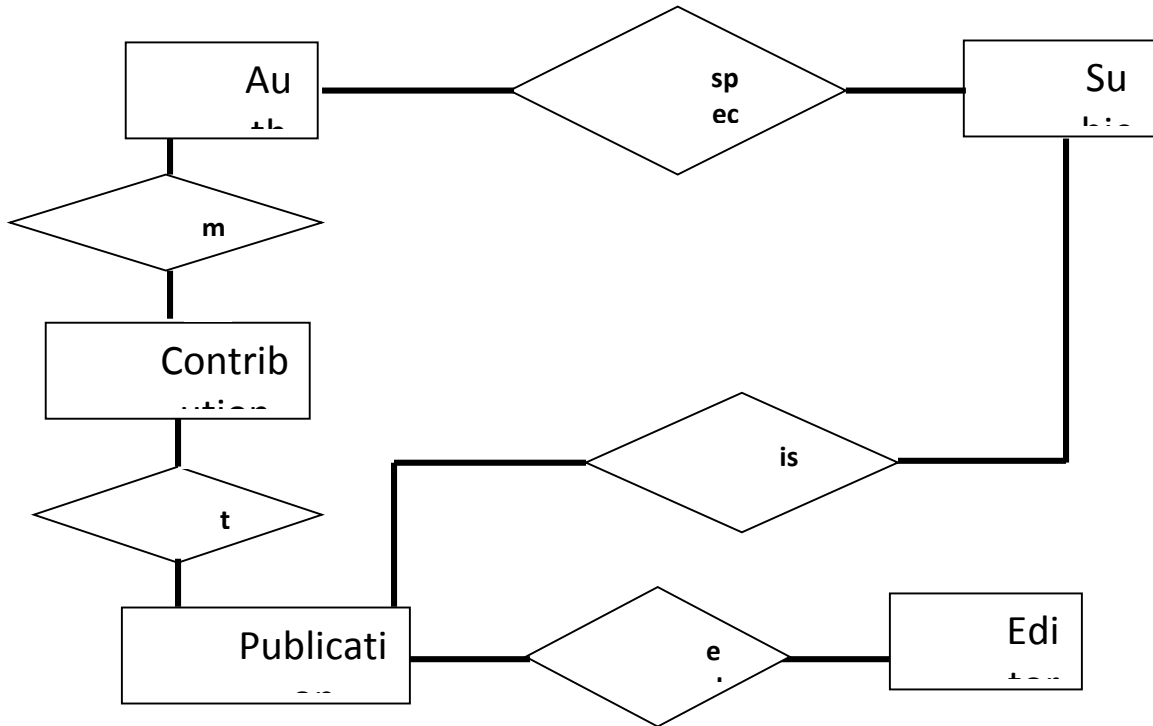
Indicate the relation which has an incorrect cardinality shown:
   A. specializes in   B. makes   C. is about   D. to   **E. None of these**

10. *The mapping of the E-R Diagram on the right is:*
   A. Bird(Species, …)
   B. Bird (<u>Species</u>, Color)
   C. BirdColors (<u>Species</u>, <u>Color</u>)
   D. Bird (<u>Species</u>, Color) and BirdColors (<u>Species</u>, <u>Color</u>)
   E. None of the above
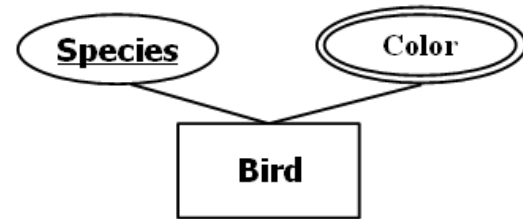
11. *All ternary relationship can always be reduced to two or three binary relationships.*
                  (A) True   **(B) False**

12. *Given the relations: X(a, b, c) and Y(c, d). Which of the following is a valid SQL statement?*
   A. SELECT a, b, c, d from X, Y Where X.c = Y.c
   B. SELECT * from X, Y Where X.a = Y.a
   C. **SELECT X.a, X.b, X.c, Y.c, Y.d from X, Y Where X.c = Y.c**
   D. SELECT a, b, c, d from X H, Y L Where H.c = L.c
   E. None of the above OR more than one of the above

13. *Entity sets are weak when all their key attributes come from other classes to which they are related.*
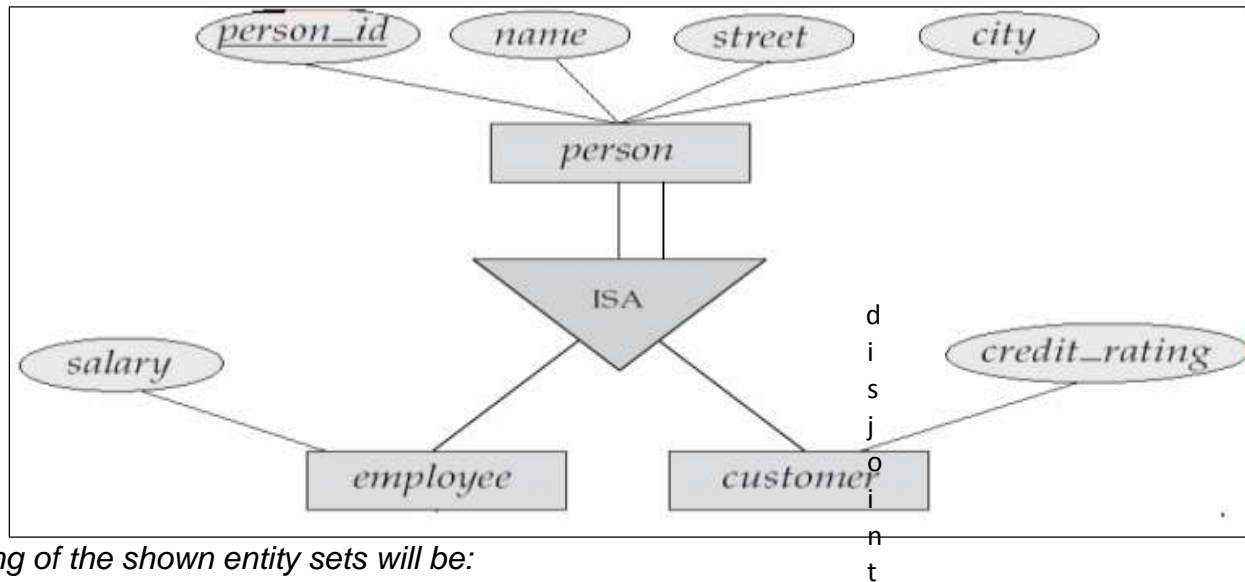
(A) True   **(B) False**

14. *Foreign keys can be null.*   **(A) True**   (B) False

15. *SQL stands for Structured Query Language.*   **(A) True**   (B) False

16. *Assume a student entity set consists of StID, Name, Age, and Major attributes. If StID can uniquely identify one student entity and so does Name, then (StID, Name, Age) is certainly a super key.*
        (A) True   (B) False

17. *The best*

mapping of the shown entity sets will be:

A. person = {Person_id, name, street, city}
    customer = {Person_id, name, street, city, credit_rating}
    employee = {Person_id, name, street, city, salary}
	C. person = {Person_id, name, street, city}
	    customer = {Person_id, credit_rating}
	        employee = {Person_id, salary}

B. customer = {Person_id, name, street, city, credit_rating}
    employee = {Person_id, name, street, city, salary}
	D. person = {Person_id, name, street, city}
	    customer = {Person_id, credit_rating}
	    employee = {Person_id, Person_id, salary}

E. None of these	

Mid

Exam 01 – 2012 Form 1

Name (Print CLEARLY): Osama Mohan Ali ... SID: 0106246

Instructions: Maximum Grade is 100 Points. Answer all FOUR questions within the provided space. SHOW your work for each question. Closed book and notes!

Q1: (25 pts) Examine the following ERM and answer the following questions:

1- (5pts) State the cardinality of each of the following relations:

a) WorksIn (Many to many)

b) ConsistsOf: Many to one

2- (10pts) Map the ERM into relational schema (just the schemas).

employee (empID, emp_Name,
adminstrative (empIPI rank)
doctor (empID, spacialty)
nurse (empID, hoursworked, Pay Perhour)
hospital (HIP, H address, budget)
Department (Did, HID (fk), address)
worksIn (empID, HID, start date)

3- (10pts) Write the full SQL statements to create the tables (WorksIn, Nurse, Department) resulting from the ERM. Make sure to write the full statements including all integrity constraints (primary and foreign keys).

creat table worksIn (empID   Varchar(10),
                     HID   Varchar(10), startdate,
                     foreign key empID (employee),
                     foreign key HID (hospital),
                     Primary key (empId, IID))

eat Table nurse (empID Varchar(10) foreign key
                 (employee), hoursworked int,
                 pay Per hour. int,
                 Primary key (empID));

eat table departn (Did Varchar (10) Primary key
                   , HID Varchr (10) foignkey hosp
                   , address varchar (40));

Q1: (18 pts) Study the following form for maintaining the record of the patient in the hospital for the daily visits. Assume the staff information does not change for the whole stay of the patient in the hospital. [Hint, consider the Patient ID as your primary key]. In each room visit, the doctor writes some notes along with the visit information.

Patient Information

Patient ID:	P001			
Patient Name:	Ahmad Hamdan			
Birth Date:	6/3/1962			

Admitting Staff information

Doctor ID:	D0045		Doctor Name:	Ameer Yaser
Nurse ID:	N0039		Nurse Name:	Ahlam Ali

	Visits information				Notes
Visit ID	Visit date	Patient Temperature	Patient Blood Pressure		
V0001	2/3/2009	37.5 C	140/90		Tired and needs care
V0002	2/4/2010	36.5 C	120/80		Getting better

Based on this form, build the database by starting from a plain table and normalizing the plain table into the 1st, 2nd, and 3rd normal forms. Make sure to clarify each step and clarify your assumptions while normalizing the database. Show all tables in each step.

1-(10 pts) Step 0: Plain Table with primary key.

Hospital (~~Hostion~~ PID , P_Info, P_name , P_Date ,
Doctor_ID , Nurse_ID, Doctor_Name , Doctor~~nur~~
, Visit_ID, Vist_date , P_temp, P_BP, notes)

2-(10 pts) Step 1: 1ˢᵗ Normal Form: Show all tables (Hint: Remove repeating groups if exist)

Patient info (P_ID, P_info, P_name, P_date)

Hospital (P_ID, Doctor_ID, nurse_ID, Doctor_name
Visit_ID, Visite Date, P_temp, P_DB, note)

3-(5 pts) Step 2: 2ⁿᵈ Normal Form: Show all tables (Hint: Remove partial dependencies if exist).

Patient info (P_ID, info, P_name, P_date)
hospital (P_ID, Doctor_ID, nurseID, Doctor_name
visite_ID, Visite Date, P_temp, P_DB, note)

-2 NO Partial

4-(10 pts) Step 3: 3ʳᵈ Normal Form: Show all tables (Hint: Remove transitive dependencies if exist).

Patient_info (P_ID, P_live, P_name, P_date) Dr, Nurse
Doctor (Doctor_ID, Doctor_name)
nurse (nurse_ID, nurse_name)
hospital (P_ID, Doctor_ID, nurse_ID, Visit_ID,
P_temp, P_DB, note)
Visit (visite_ID, Visite Date)

Q3 (20 pts): Answer this question based on the following ERM. Hints: There are 3 tables resulting from this ERM model ('Owner, 'owns', and 'car' tables).
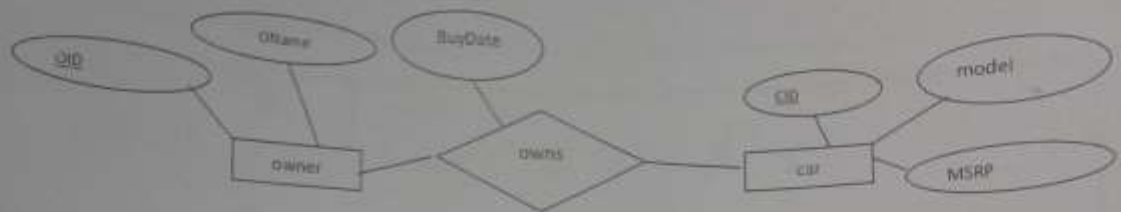
1. (5 pts) Write SQL statement to insert a new record in the car table with the following data:

(CID='101', Model='Honda', MSRP=15449.50)

```
insert into car (CID, Model, MSRP)
Values ('101', 'Honda', 15449.50);
```

2. (5 pts) Write SQL statement to retrieve

OID, OName, CID, BuyDate

for each owner and his/her car.

```
select O.OID, O.Oname, C.CID, OS.BuyDate
from owner as O, Car as C, owns
as OS)
whre
```

3. (5 pts) Write SQL statement to retrieve
   CID, model, MSRP

for each car model starts with an 'A' [Hint: model should always start with an 'A'].

```
select * from car
where model like 'A%'
```

4. (5 pts) Write SQL statement to Alter the table Car by adding a new attribute call it Color

```
Alter table car add color varchar(10);
```

Q4: (20 Pts) Study the following ERM to answer this question:
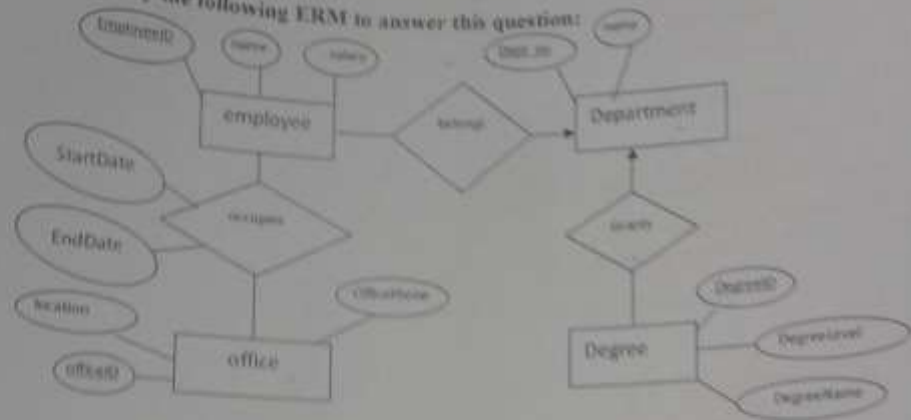
1. **(10pts)** Upon this ERM, is it allowed for two employees to share the same office? Justify your answer by specifying the cardinality.

> yes   the cardinality is many to many
>
> only

2. **(10 pts)** Upon this ERM, it is possible for a department not to offer any degree. Change the ERM to force every department to offer at least one degree. Draw only the exact portion of the ERM.

Exam 02 – 2012 Form 2

Name (Print CLEARLY):................................ StID: 0105449

Instructions: Maximum Grade is 100 Points. Answer all FOUR questions within the provided space. SHOW your work for each question. Closed book and notes!

Q1: (25 pts) Examine the following ERM and answer the following questions:

1- (5pts) State the cardinality of each of the following relations:

a) WorksIn   many to many

b) Consistsof: one to many (total)

2- (10pts) Map the ERM into relational schema (just the schemas).

employee(empId, empname)
administrative(empId, empname, rank)
Doctor (empId, empname, specialty)
nurse (empId, empname, hours worked)
Hospital (HID, Haddress, budget)
Department (DID, Daddress, HID) [fk]
worksIn(EmpID[fk], HID[fk], startdate)
consists of (DID, HID, Dept) [fk]

✓

3- (10pts) Write the full SQL statements to create the tables (WorksIn, Nurse, Department) resulting from the ERML. Make sure to write the full statements including all integrity constraints (primary and foreign keys).

creat worksIn: creat table worksIn (
    EmpID varchar(10), foreign key refere
    employee(EmpId);
HID varchar(10) foreign key refernce to adminst
    (HID)
    startdate date,)

rse: creat table nurse(EmpId varchar(10) primary key
empname varchar(20), hours worked integer)

whint: creat table departmint(DID varchar(10) pri
    Daddress varchar(20), Dept varchar(10) tot
        refers to
    HID

HID varchar(10) forigen key referece to Ho

Q2: (35 pts) Study the following form for maintaining the record of the patient in hospital for the daily visits. Assume the staff information does not change for the wh stay of the patient in the hospital. [Hint: consider the Patient ID as your primary key]. each room visit, the doctor writes some notes along with the visit information.

Patient Information				
Patient ID:	P001			
Patient Name:	Ahmad Hamdan			
Birth Date:	6/3/1962			

Admitting Staff information				
Doctor ID:	D0045		Doctor Name:	Ameer Ya
Nurse ID:	N0039		Nurse Name:	Ahlam Al

Visits information				
Visit ID	Visit date	Patient Temperature	Patient Blood Pressure	Notes
V0001	2/3/2009	37.5 C	140/90	Tired and care
V0002	2/4/2010	36.5 C	120/80	Getting b

Based on this form, build the database by starting from a plain table and normalizing th plain table into the 1st, 2nd, and 3rd normal forms. Make sure to clarify each step and cla your assumptions while normalizing the database. Show all tables in each step.

1-(10 pts) Step 0: Plain Table with primary key.

patient information (patientID, patient name,

patient informaition (PID, Pname, BD, Doctor Idi

doctor name, nurse ID, nurse name, visitID, patient te

patient Blood, note)

2-(10 pts) Step1: 1st Normal Form: Show all tables (Hint: Remove repeating groups if exist)

paitint info(PID, Pname, BD, Doctorid, doctorname, nurseid, nurse name)

visit (PID, visitdate, visitID, visitdate, paitint temp, paitint blood, note)

✓

3-(10 pts) Step 2: 2nd Normal Form: Show all tables (Hint: Remove partial dependencies if exist)

...t info(PID, pname, BD, Doctorid, doctor name, nurse id, nurse name)

...t(PID, visitID, paitint temp, paitint blood, note)

...fo(visitID, visitdate)

No Partial

−3

4-(10 pts) Step 3: 3rd Normal Form: Show all tables (Hint: Remove transitive dependencies if exist)

visit info (visitID, visitdate) ✗

visit(PID, visitID, paitint temp, paitient blood, note)

doctor(doctorid, doctorename)

nurse(nurseid, nursname)

...tint info(PID, Pname, BD, Doctor Id, nurseid)

✓ −2

Q3 (20 pts): Answer this question based on the following ERM. Hints: There are 3 tables resulting from this ERM model ('Owner', 'owns', and 'car' tables).

1. (5 pts) Write SQL statement to insert a new record in the car table with the following data:

   (CID='101', Model='Honda', MSRP=15449.50)

```
Insert into car set (cID, model, mSRD) values
('101', 'Honda', 15449.50)
```

2. (5 pts) Write SQL statement to retrieve

   OID, OName, CID, BuyDate

   for each owner and his/her car.

```
Select O.old, O.oname, C.rser
Sellect (O.old, O.onams, C.CID, B.Byy date)
from owner o, car c, owns of
whec ?        -2
```

3. (5 pts) Write SQL statement to retrieve

   CID, model, MSRP

for each car model starts with an 'A' [Hint: model should always start with an 'A'].

```
select ( CID , model , MSRP ),
from Car,
where CID link (A%)
```

4. (5 pts) Write SQL statement to Alter the table Car by adding a new attribute call it
   Color.

```
alter table car
add color varchar(20),
```

Q4: (20 Pts) Study the following ERM to answer this question:
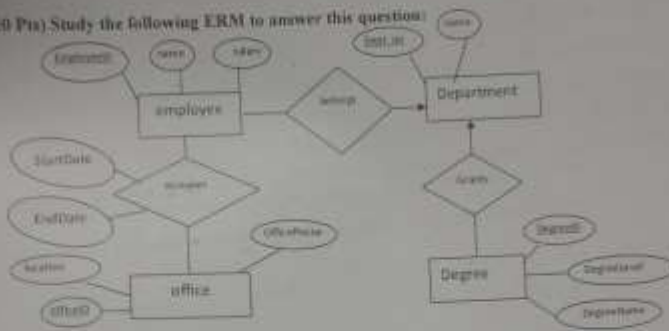
1. (10pts) Upon this ERM, is it allowed for two employees to share the same office? Justify your answer by specifying the cardinality.

yes, they can share offic

cardinality (many to many)

2. (10 pts) Upon this ERM, it is possible for a department not to offer any degree. Change the ERM to force every department to offer at least one degree. Draw only the exact portion of the ERM.

department

grad
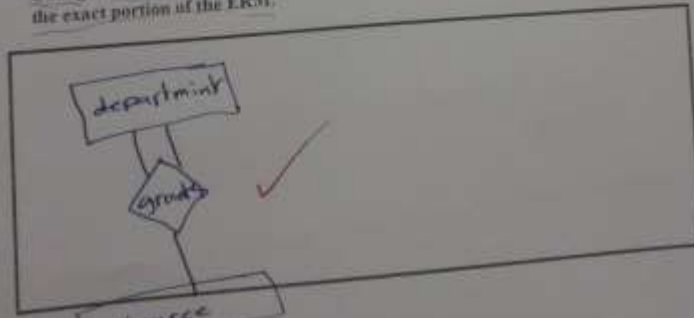
Exam 03 – 2011/2012

- امتحان ال data base للفصل الأول 2011\2012 أغلب الامتحان ضع دائرة .. و آخر شيء سؤال حل *اول مجموعة من الدوائر: فيها جدول مقسم حسب ال normaization و الأسئلة عنها مقسمة بين فهم و على الرسم * المجموعة الثانية : رسمة ERD عليها أسئلة مكتوب المطلوب كلاما .. و الدوائر هي جمل sql بتحقق الجمل في الأسئلة و في بعض الخيارات فيها أكثر من جواب أو أنه الجمل و لا وحدة صحيحة * المجموعة الثالثة : رسمة ERD المكتوب هنا الجمل .. و الدوائر هي تفسير الجمل في السؤال .. و في كتير دقة في الكلمات .. و البعض بتكون جملة ال sql خاطئة أصلا *المجموعة الأخيرة من الدوائر .. بتحكي بشكل عام عن ال grant و ال revoke و extract يعني معلومات عامة بدون رسمة ** السؤال الأخير كتابة مكون من 5 فروع .. الأربعة الأولى منها بيذكر مطلوب معين و لازم نكتبه باستخدام ال algebric و بين أقواس مكتوب ايش اللي لازم نستخدمه بس احنا نكتب الجملة الفرع الأخير مكتوب جملة algebric و المطلوب نكتب معناها .. الامتحان بشكل عام دقيق و بدو تركيز

Exam 04 – 2009

24.5 / 30

The University of Jordan
King Abdullah II School for Information Technology
Department of Computer Information Systems (CIS)
First Semester-2009/2010

Course: Database Management Systems (1902321)
Mid-Term Exam   23/11/2008

اسم الطالب (بالعربية) :
اسم المدرس: الدكتور طوافت زيعون ن
رقم الطالب الجامعي :
رقم (وقت) الشعبة :
الرقم التسلسلي في الشعبة:

Q1) If you are given the following relations (8 Marks)

8

GOALS (GL)

Player_no	Match_no	Player-goals

MATCH(MT)

Match_no	stadium

TRAINER (T)

Trainer_no	name	rank

PLAYER (P)

Player_no	PLname	Club_No	Salary	play-position

TASK (TK)

Club_no	Match_no	Trainer_no	team-goals

CLUB (C)

Club_no	Club_name	Chairman

Model this schema as an ERD determining the involved entity set(s), relationship set(s), related attributes and the cardinalities.

Answer:

1

V1
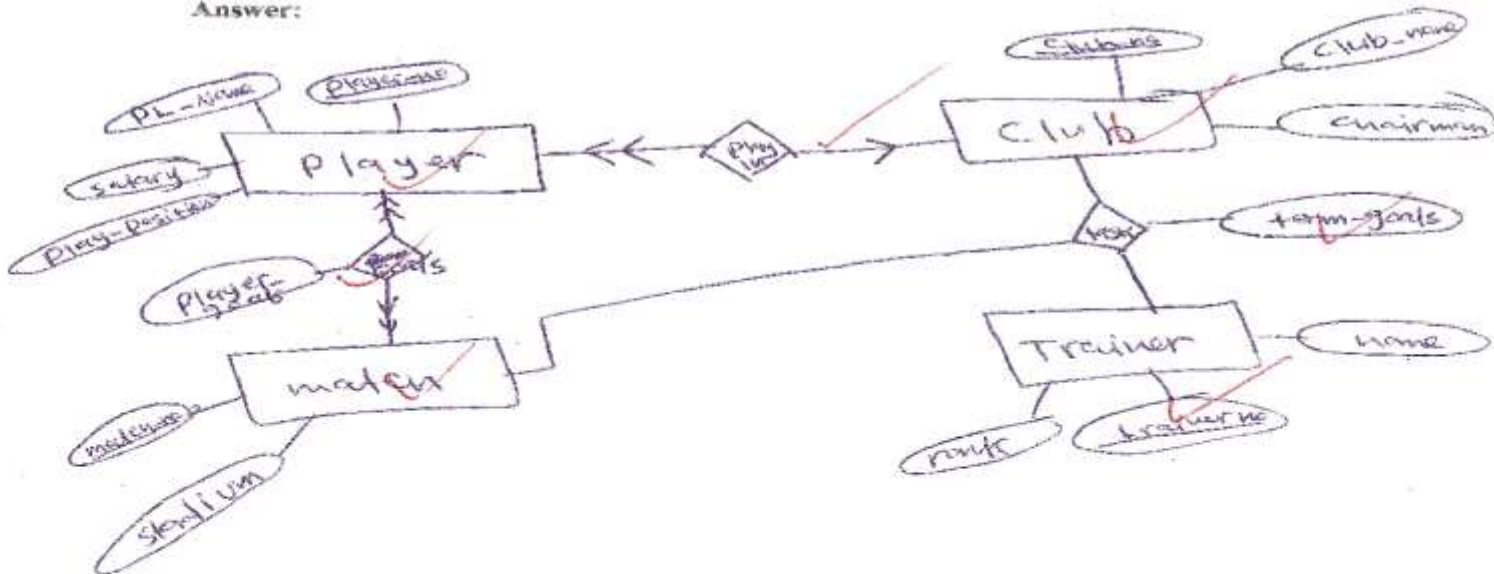
Q2) Map the following ERD to equivalent relations (Schema) (9 Marks):

7.5 / 9

Answer:

employee
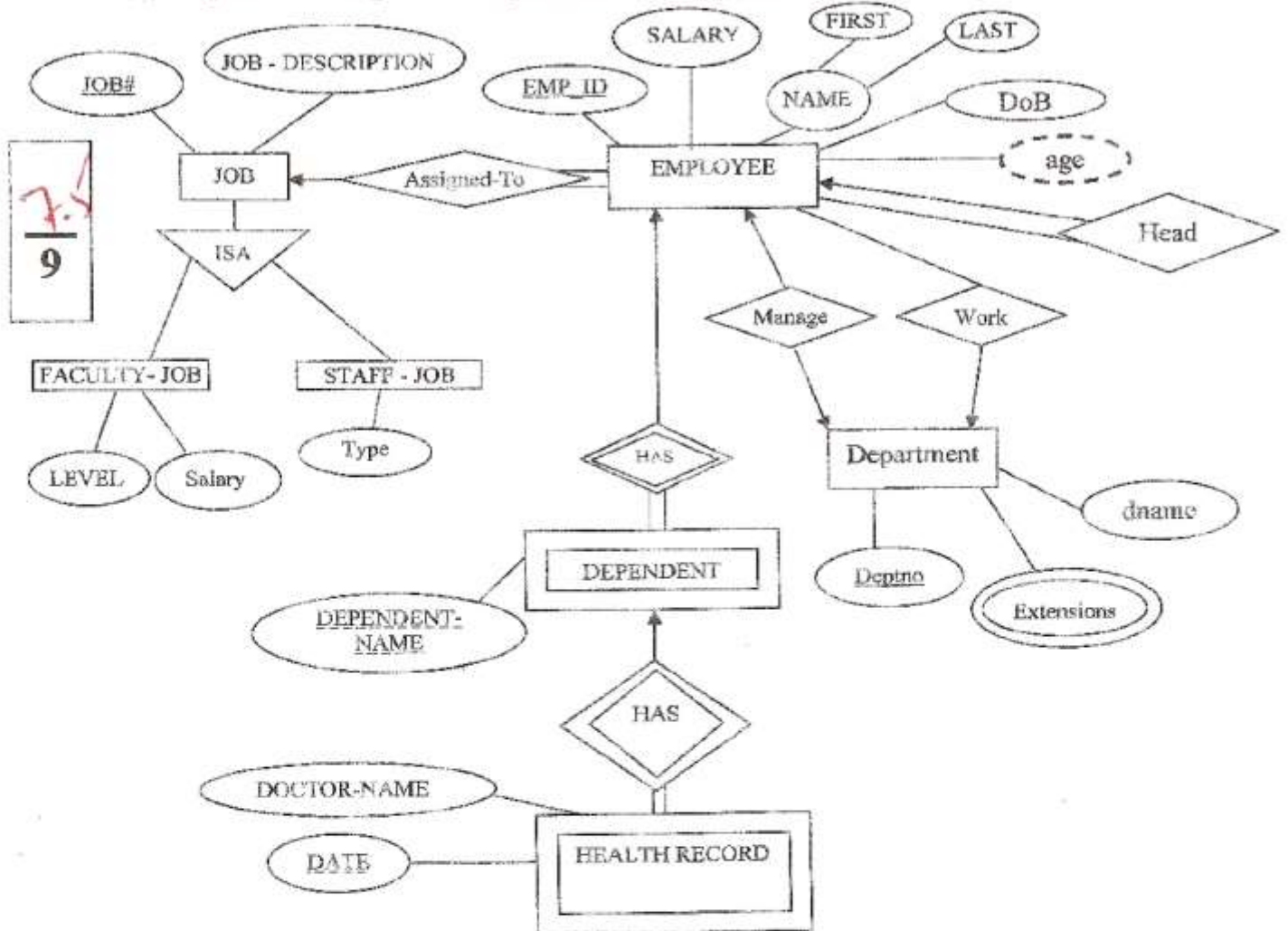
Emp_ID	Salary	DoB	Dept_N	JOB#

JOB

JOB #	Job-Description

name

empID	First	Last

HEAlth Record

Doctor-Name	Date	depart name	Emp_ID

Department

Dept_No	d-name	dept-id

Dependent

Dependent-name	Emp_ID

extensions

2 | Dept-No | value of extension |
|---------|--------------------|

Faculty JOB

JOB#	Level	Salary

STAFF JOB

JOB#	Type

V1

Q3) Specify whether each of the following attribute combinations is a Super Key (SK), Candidate Key (CK), both (B), or neither nor (NN) a 'student' entity set. The student entity set consists of StID, Name, Age, and Major attributes. Note that StID can uniquely identify one student entity and so does Name (3 Marks).

Seq.	Attribute(s)	Type
1	Name	B
2	Age	NN
3	StID, Name, Age	SK
4	StID	B
5	StID, Name	SK
6	StID, Age	SK

Q4) Answer the subsequent Multiple Choice Questions and fill your answer (A, B, C, D, or E) in CAPITAL in the following table. Note that only the table will be marked (10 Marks).

Question #	Answer.	Question #	Answer.
1	a	11	d
2	d	12	c
3	e	13	c
4	d	14	b
5	e	15	d
6	b	16	c
7	b	17	c
8	a	18	a
9	d	19	a
10	c	20	a

1) To transform a relation from first normal form to second normal form we must remove which one of the following?
   a. All partial-key dependencies
   b. All inverse partial-key dependencies
   c. All repeating groups
   d. All transitive dependencies
   e. None of the above

2) A lack of normalization can lead to which one of the following problems
   a. Lost Updates
   b. Deletion of data
   c. Insertion problems
   d. Deferred updates
   e. Deadlock

   C

3) A given relation is known to be in third normal form. Select the statement which can be inferred from this:
   A. All attributes contribute to the primary key
   B. Every determinant is a candidate key
   C. Each non-key attribute is determined by the primary key
   D. Each non-key attribute determines the primary key
   E. The relation is not in fourth normal form

   C

3

Consider the following relation to answer the subsequent 2 questions

Vehicles

Vid	vtype	owner_id	owner_name	Suspect_id	Suspect_Name
207	Escort	17	Jack	10	John
205	Quest	22	Mary	10	John
336	Neon	17	Jack	14	Joe
208	Camry	15	Sue	18	James
207	Escort	17	Jack	19	Henry

4) The above Vehicles table is in
   a) 1NF
   b) 2NF
   c) 3NF
   d) Not normalized
   e) None of the above

5) In the above Vehicles table all of the following dependencies exist EXCEPT
   a) Vid → vtype
   b) owner_id → owner_name
   c) Suspect_id → Suspect_Name
   d) Vid → owner_id
   e) Vid, owner_id → Suspect_Name

6) A relation is in second normal form if all its non-key attributes are:
   a. Dependent on part of the key
   b. Dependent on all of the key
   c. Independent of the key
   d. Independent of each other
   e. Independent of any other relation

7) A relation having only one candidate key is third normal form if it is 2NF and _____.
   a. no nonkey attribute is determined by only part of the key
   b. no nonkey attribute is dependent on another nonkey attribute
   c. no part of the key is dependent on another part of the key
   d. there are no partial functional dependencies
   e. None of the above

8) If X and Y are sets of attributes of relation R, we say that Y is functionally dependent on X if _____.
   a. for each X value there is only one Y value
   b. for each Y value there is only one X value
   c. no two X values have the same Y value
   d. when two rows have the same Y value they also have the same X value
   e. None of the above

9) What is the highest normal form level satisfied by the following table design?

A1	A2	A3	A4	A5

a. Not in 1ˢᵗ Normal form
b. 1NF
c. 2NF
d. 3NF
e. None of the above

10) There are two relations X and Y. Relation X has 1 column (a) and 2 tuples, relation Y has 3 columns (b, c, d) and 4 tuples. How many records will be produced by the SQL statement:

SELECT a FROM X, Y.
a. 4
b. 6
c. 8
d. information is not complete
e. None of these

11) A series of actions that must be completed as a unit or not at all is known as a(n):
a. Horizontal fragment
b. Image
c. Lock
d. Transaction
e. Vertical Fragment

12) When an attribute can be calculated from other attributes without the need to store it physically, it is called:
a. Multi-value
b. Composite
c. Derived
d. Single-Valued
e. Simple Attribute

13) To have Oracle display the structure of a table named Employee, write
a) SELECT * FROM EMPLOYEE;
b) SHOW Employee;
c) DISPLAY Employee;
d) DESC Employee;
e) None of the above

14) To eliminate duplicates in the results of a SQL query, use the option _____.
a) Unique
b) Distinct
c) No Repeats
d) Order by
e) None of the above

15) If, in order to exist, every entity must participate in the relationship, then participation of the entity set in that relationship set is _____ participation.
   a) minimum
   b) integral
   c) partial
   d) Total
   e) None of the above

16) A _____ constraint means that an entity of the superclass cannot be a member of more than one subclass of the specialization.
   a. Completeness   b. Total
   c. Disjointness   d. Participation
   e. Uniqueness

17) Each of the following is an argument which might be used to support the use of relations which are not fully normalized. Select the weakest argument.
   a. A fully normalized database may perform too slowly
   b. Full normalization may compromise existing applications/systems
   c. A fully normalized database may have too many tables
   d. Full normalization may make some queries too complicated
   e. A fully normalized database may result in tables which are too large

18) Which of the following types of attributes can be represented directly as a column in a relational model?
   a. single-valued, non-composite
   b. multiple-valued, non-composite
   c. derived, single-valued
   d. composite, single-valued
   e. None of the above

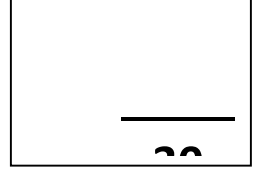19) Which of the following is generally a benefit of normalization?
   a. Performance is improved
   b. Insertion anomalies are avoided
   c. Selection anomalies are avoided
   d. Number of tables is reduced
   e. None of the above.

20) Normalization is a process for assigning _____ to entities.
   a. data
   b. files
   c. attributes
   d. relations
   e. None of the above

6

Exam 05 – 2008

<u>**Course:**</u> **Database Management Systems (1902321)**

Mid-Term Exam   12/11/2008

رقم الطالب الجامعي: اسم الطالب (بالعربية) :

رقم الشعبة :   إسم المدرس:

الرقم التسلسلي في الشعبة:

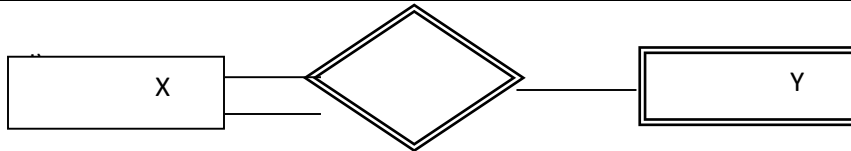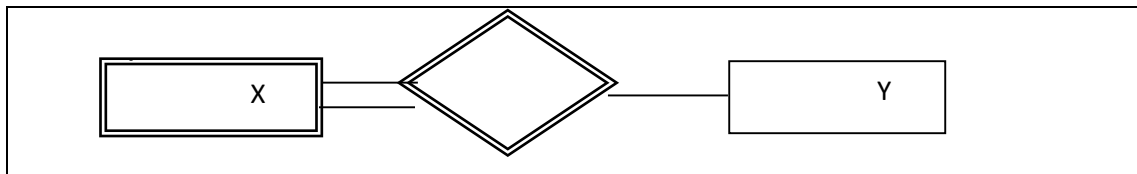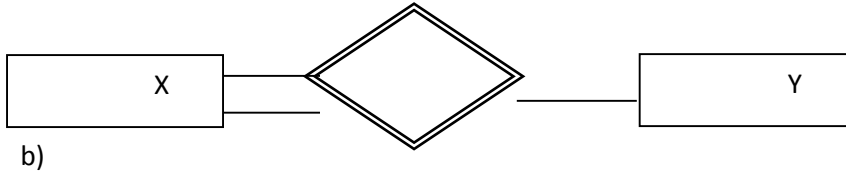## Q1) Select the best option in each of the following (10 Points)

1) All of the following are examples of DBMS except

    a. Oracle   b. SQL server

    c. Banking system   d. MS ACCESS

    e. None of the Above

2) Which one of the following E-R diagrams does NOT have an error?
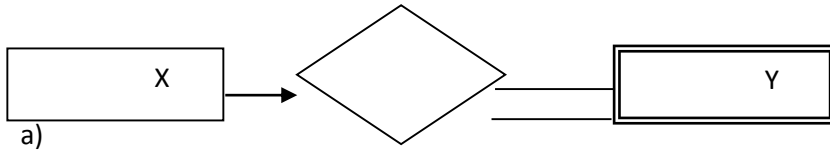
3) All of the following are drawbacks of file system to store data EXCEPT:

a. Data Isolation | **b. More expensive than DBMS**
c. Difficulty in accessing data | d. Data Redundancy and Inconsistency
e. Concurrent Access by multiple Users

4) One of these statements is correct

a. Every super key in a relation is necessarily a candidate key.
b. Every super key in a relation is necessarily a possible primary key.
c. If we have two super keys, the one with minimum attributes should be chosen as the primary key
d. Every candidate key is a super key.
e. When some attributes of a super key is also a super key, the larger super key should be chosen as a primary key.

5) When creating a view, columns from the original table can be _____.

a. Renamed, but not reordered | b. Reordered, but not renamed
c. Neither renamed nor reordered | **d. Both renamed and reordered**
e. All of the above

Consider the following table and then answer questions 6-7:

ClassNo	FirstName	Address
1	Raed	Amman
1	Ahmad	Aqaba
2	Raed	Zarqa
2	Naser	Amman
2	Faisal	Amman

6) The following is an example of a **super key**:

    a. ClassNo   b. FirstName
    c. FirstName, Address   d. ClassNo, FirstName, Address
    e. C+D

7) The following is an example of a **candidate key**:

    a. ClassNo   b. FirstName
    c. FirstName, Address   d. ClassNo, FirstName, Address
    e. C+D

8) To erase records in a table without modifying its structure, we use the following command:

    a. Drop   **b. Delete**
    c. Update   d. Alter
    e. All of the above

9) All of these terms are equivalent to an **Entity** except

    a. Object   b. Concept
    c. Thing   **d. Attribute**
    e. Item

10) People who act as users of one of the permanent database application programs that have been written previously without knowing the structure of the database:

    a. Application programmers.   b. Sophisticated users.
    c. Specialized users.   **d. Naïve users.**
    e. None of the above

11) When an attribute can be calculated from other attributes without the need to store it physically, it is called:

a. Multi-value
b. Composite
c. Derived
d. Single-Valued
e. Simple Attribute

12) A binary relationship between the two entities, SALESPERSON and VEHICLE, where (a) each salesperson entity can be related to many vehicle entities (up to n), and (b) each vehicle entity is related to at most one salesperson entity may have a cardinality constraint of _____ :

a. Binary
b. 1:N
c. N:1
d. 1:1
e. M:N

13) To eliminate duplicates in the results of a SQL query, use the option _____.

a. Unique
b. Distinct
c. Order by
d. Rename the field
e. None of the above

14) If, in order to exist, every entity must participate in the relationship, then participation of the entity set in that relationship set is _____ participation.

a. Minimum
b. Integral
c. Partial
d. Total
e. Disjoint

15) A weak entity is defined to be_____

a. An entity that has enough attributes to construct a primary key.
b. Exist independently
c. Has a Primary key
d. Has no Discrimination
e. None of the above

16) A _____ constraint means that an entity of the superclass can **not** be a member of more than one subclass of the specialization.

a. Completeness
b. Total
c. Disjointness
d. Participation
e. Uniqueness

17) In a relationship, when a primary key from one table is also defined in a second table, the field is referred to as a _____ in the second table.

a. Combined key
b. Redundant field
c. Primary key
d. Foreign key
e. None of the above

18) A special operator used to check whether an attribute value matches a value contained within a subset of listed values is ____.

a.	**Between**	b.	Is Null
c.	Like	d.	IN
e.	None of the above		

19) Data consistency means _____.

a.	All data is shared	b.	Users are allowed to see exactly the same data
c.	There is no redundancy of data	**d.**	**All occurrences of the same data item agree**
e.	None of the above		

20) The data about data such as the name and size of data items is described as _____.

a.	**Metadata**	b.	Data instances
c.	The miniworld	d.	Enterprise data
e.	None of the above		

Q2) Consider the following tables then answer the subsequent questions (20 Points)

Doctors

doc no	Name	salary	Dept_no
1	Ahmad	850	2
2	Hashem	1200	3
3	Anas	1450	1

Department

Dept_no	Name
1	Pediatric
2	Nerves
3	Dentistry
4	Pharmacy

4	Rana	900	1
5	Hussien	1140	4

Patients

pat_no	Name	City	Dept_no
1	Omar	Amman	1
2	Dalal	Aqaba	1
3	Ola	Salt	3
4	Ahmad	Amman	2
5	Hana	Mafraq	4
6	Lara	Irbid	2
7	Majed	Amman	3

Courses

Course_no	Topic
1	sclerama
2	Pachyderm
3	B-cell
4	Bio-assay
5	Rash
6	v-gene

Attendance

Course_no	Doc_no	Part_date
1	1	5/3/2004
1	2	3/6/2005
3	3	2/4/2006
4	3	3/4/2006
4	5	1/10/2005
6	4	2/4/2004

6.2. |Draw the ERD the best describes the above tables (5 Points)
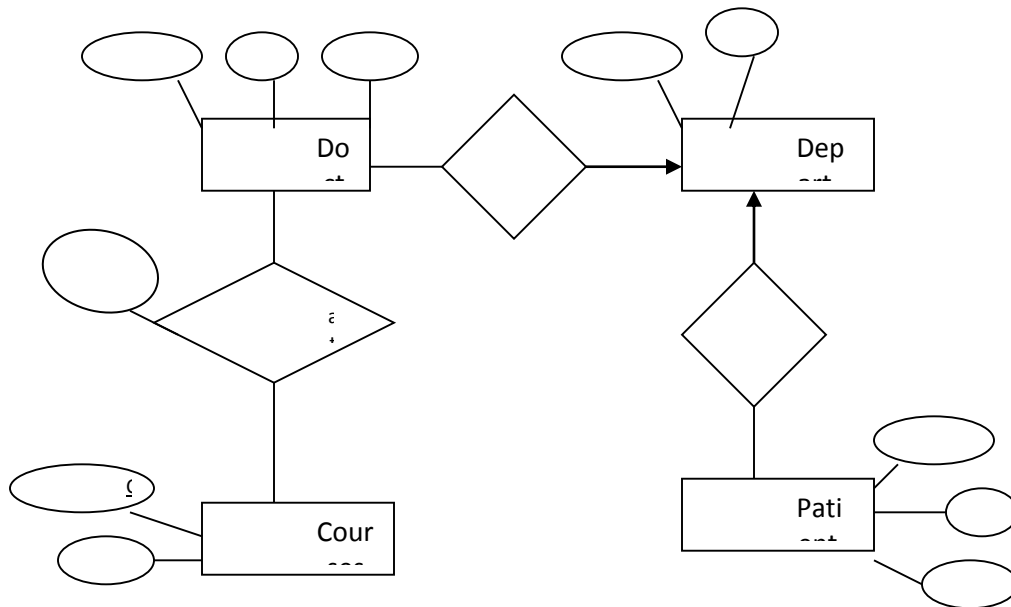
6.3. |Write an SQL statement to create the Attendance table with all its fields and constraints (3 Points).

    Create table attendance
    (Course_no int,
     Doc_no int,
     Part_date date,
     Constraint pk1 primary key (course_no, doc_no),
     Constraint fk1 foreign key (course_no) references courses(course_no),
     Constraint fk2 foreign key (doc_no) references doctors(doc_no)
)

6.4. Write an SQL statement to add a new attribute called phone_num of type char(10), to the patient table (1 Point).

Alter table patient add phone_num char(10)

6.5. **Write an SQL statement to retrieve the name of all patients with their department name sorted by patients city (3 Marks).**

Select patients.name, department.name

from patients,department

Where patients.dept_no= department.dept_no

Order by patient.city.

6.6. **Write an SQL statement to produce doctors working in department 3 or 4 and has salary greater than 1000 as follows (3 Points):**

Dept_name   Name   salary

_____

Dentistry   Hashem   1200

Select department.name as dept_name, doctors.name, doctors.salary

from department, doctors

where department.dept_no = doctors.dept_no

and   (department.dept_no=3 or department.dept_no=4)

and   doctors.salary>1000

6.7. **Consider the following SQL statements and find the Number of records and fields (5 Points):**

1) Select name from Doctors where salary>1000

Union

Select name from Doctors where dept_no>1

2) Select * from Patients where city like '% a %'

3) Select distinct city from patients where city like '% a %'

4) Select distinct pat_no ,city from patients
                     where dept_no between 2 and 3

5) Select salary from doctors, attendance, courses
                     Where doctors.doc_no=attendance.doc_no

                     And attendance.course_no=courses.course.no

                     And topic='Bio-assay'

Answer:

Query #	Number of Records	Number of Fields
1	4	1
2	6	4
3	4	1
4	4	2
5	2	1

Exam 01 – 2011 Form 1
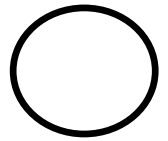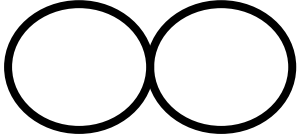
The University of Jordan

King Abdullah II School for Information Technology   Duration **2hrs**

Department of Computer Information Systems   Spring**, 2011**

1902321: Database Management Systems.   Final Exam

Instructors: Dr. Raja Alomari (coordinator)**, Dr. Omar Adwan,** and **Ms Walaa Qutechat.**

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Name (Print CLEARLY):………………………………………..
StID:……………………

Q1: (15 pts) Study the following form for a trading company that sells wholesale grocery items. Based on this form, create a database in the 3rd normal form by following the normalization rules step-by-step. [Hint, consider the SaleID as your primary key].

SALE FORM				
Sale ID:	**786540-02027**			
Purchase Date:	1/2/1973			
Buyer Information			**Clerk information**	
Buyer ID:	54298		**Clerk ID:**	5729
Buyer Name:	Ahmad Hamdan		**Clerk Name:**	Salem Saleem
Items information				
Item ID	**Item Description**	**Unit Price**	**No of boxes**	**Sub-total**
0301	Coffee	20	9	180
0012	Tea	30	10	300
0032	liquid Milk	2	30	60
Total				JD 1080

Step 0: Plain Table with primary key

SaleID, PurchaseDate, BuyerID, BuyerName, clerkID, clearkName, ItemID, ItemDescription, UnitPrice, NoBoxes

(5 pts) Step1: 1st Normal Form: Show all tables (Hint: Remove repeating groups if exist)

Table 1: <u>SaleID</u>, PurchaseDate, BuyerID, BuyerName, clerkID, clearkName,

Table 2: <u>SaleID , ItemID</u>, ItemDescription, UnitPrice, NoBoxes

-1 pnt per mistake

(5 pts) Step 2: 2nd Normal Form: Show all tables (Hint: Remove partial dependencies if exist).

Table 1: <u>SaleID,</u> PurchaseDate, BuyerID, BuyerName, clerkID, clearkName,

Table 2: <u>SaleID , ItemID,</u> UnitPrice, NoBoxes   FK(ItemID)

Table 3: <u>ItemID</u>, ItemDescription

-1 pnt per mistake upto -3

(5 pts) Step 3: 3rd Normal Form: Show all tables (Hint: Remove transitive dependencies if exist).

Table 1: <u>SaleID</u>, PurchaseDate, BuyerID, clerkID,   FK(BuyerID), FK(clerkID)

Table 2: <u>SaleID , ItemID</u>, UnitPrice, NoBoxes   FK(ItemID)

Table 3: <u>ItemID</u>, ItemDescription
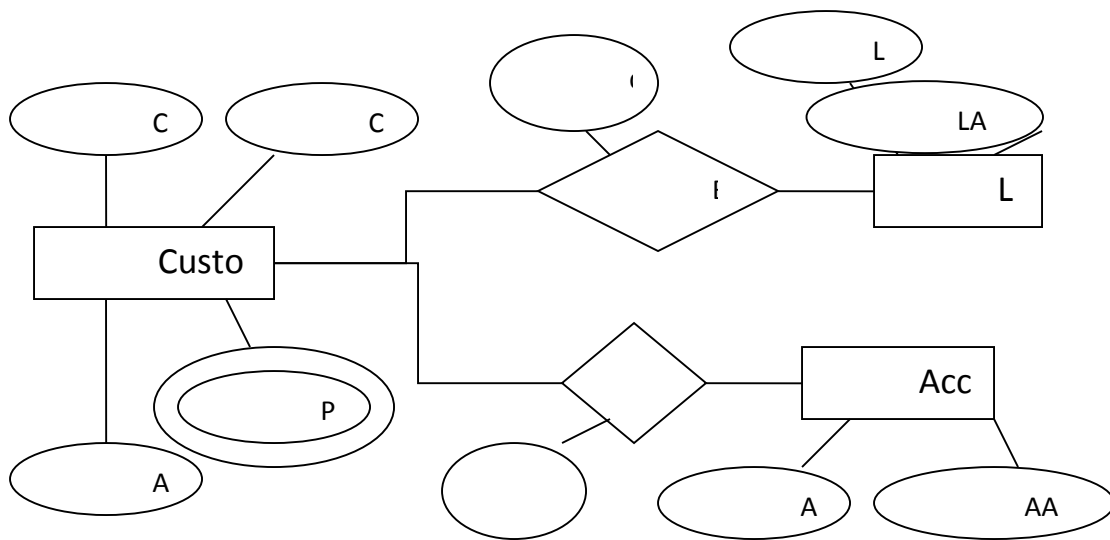
Table 4: <u>BuyerID</u>, BuyerName

Table 5: <u>clerkID</u>, clerkName,

-1 pnt per mistake upto -

**Q2: (5 pts) Draw the ERM that represents the database of Q2.**

Q3: (10 pts) Study the following ERM and answer questions below (2pnts each)

1. The SQL statement that retrieves all customer names (**without** duplication) who had a loan is:
   a. select distinct **custName** from **customer**, **borrow**;
   b. select distinct **custName** from **customer** where **LID** in (select **LID** from **loan**);
   c. select distinct **custName** from **customer** where **CID** in (select CID from **borrow**);

    d. a + c

2. The SQL statement that retrieves all customer names with accounts having an amount over JD50000 (**without** duplication) is:
   a. select distinct **custName** from **customer**, **account** where AAmount > 50000;
   b. select distinct **custName** from **customer** where **CID** in (select **CID** from **has**, **account** where **has**.**AID** = **account**.**AID** and **AAmount** > 50000);
   c. select distinct **custName** from **customer**, **has** where **AAmount** > 50000;
   d. b + c

3. The SQL statement that retrieves the **summation** of all borrowed loans is:
   a. select **LAmount** from **loan** where **LID** in (select **LID** from **borrow**);
   b. select **sum, LAmount** from loan, borrow where loan.LID = borrow.LID;
   c. select **sum, LAmount** from loan where LID in (select LID from borrow);
   d. None of the above.

4. The SQL statement that retrieves all loan transactions occurred on April 1st, 2009:
   a. select * from **loan** where **date1** = '01-April-2009';
   b. select **L.LID**, **L.LAmount**, **B.date1** from **loan** L, **borrow** B where **L.LID** = **B.LID** and **B.date1** = '01-April-2009';
   c. select **L.LID**, **L.LAmount** from **loan** as L where **LID** in (select **LID** from **borrow** where **date1** = '01-April-2009');
   d. b + c

5. The SQL statement that retrieves customer IDs, average loan amounts grouped by the CIDs:
   a. select **CID**, **CName** from **customer** C , **loan** L, **borrow** B where **C.CID** = **B.CID** and **B.LID** = **L.LID** and **L.LAmount** = avg(**L.LAmount**);
   b. select **B.CID**, avg(**L.LAmount**) from **loan** L, **borrow** B where **B.LID**=**L.LID** group by **B.CID**;
   c. select **CID**, **CName** from **customer** C where **CID** in (select **CID**, avg(**L.LAmount**) from **borrow** B, **loan** L where **B.LID** = **L.LID** group by **B.CID**;
   d. None of the above
   Q4: (10 pnts) Given this ERM, Answer the following (**1 pnt each**):
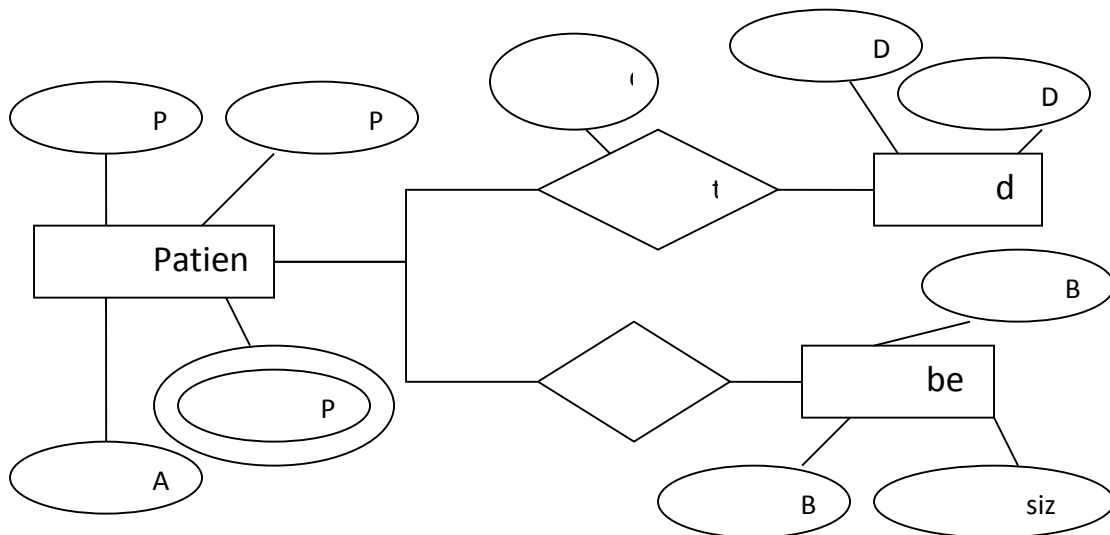
1. The SQL statement " **select P.PName, Ph.PhNo from Patient P, PatientPhones Ph where P.PID = Ph.PID;**" retrieves:
   a. All patient information and their phone numbers;
   b. Patient names and and only one phone number.
   c. All Patient names and all phone numbers.
   d. This statement is wrong.
2. The SQL statement " **(select P.PID from Patient P) union (select T.PID from treats T);**"
   retrieves:
   a. All patient IDs regardless of receiving a treatment or not.
   b. All patients who have been treated by a doctor.
   c. Some of the patients who have been treated by a doctor.
   d. None of the above.
3. The SQL statement " **select P.PName from Patient P where P.PID in (select U.PID from Uses U) intersect (select T.PID from treats T);**" retrieves:
   a. All patient names who received treatment and used a bed.
   b. All patient names who used a bed but did not receive a treatment.
   c. All patient names who received a treatment but did not use a bed.
   d. None of the above.
4. To create the table **uses**:
   a. Create table uses (PID varchar2(20), BID varchar2(20), primary key(BID, PID));
   b. Create table uses (PName varchar2(20), BID varchar2(20), primary key(BID));
   c. Create table uses (PID varchar2(20), BID varchar2(20), primary key(PID,BID), foreign key(PID) references (PID), foreign key(BID) references (BID));
   d. None is correct.
5. To create the table **doctor**:
   a. Create table doctor (DID varchar2(20), Dname varchar2(50), primary key(DID));
   b. Create table doctor (DID varchar2(20), Dname varchar2(50) not null, primary key(DID), foreign key (DID) references treats(DID));

c. Create table doctor (DID varchar2(20), Dname varchar2(50) not null, primary key(DID));
d. a + c are both correct.

6. The statement "**update bed set size = 'queen'** " will
   a. Add an attribute size to the table **bed** and set the default value to 'queen'.
   b. Set the default value for any new inserted **bed** record to 'queen'
   c. Set all the size values for each record in the table **bed** to 'queen'
   d. b + c are both correct

7. The statement "**insert into patient(PID, Address, PName) values ('0001','Amman', 'Ahmad')** " will
   a. Add three attributes to the table patient.
   b. Add one record to the table patient with an ID = '0001' but leaves both the address and PName empty because they are not in order.
   c. Add one record to the table patient with an ID = '0001', address = 'Amman', Name = 'Ahmad'
   d. Either b or c might happen depending on the SQL version you are using.

8. The statement "**drop table bed where BID = '0001'** " will:
   a. Drop all the record with ID = '0001'
   b. Drop all the database
   c. Drop the tables bed and uses because they depend on each other.
   d. This statement is wrong in syntax.

9. The statement " **update bed set BCount = case when size='queen' then BCount + 20 when size='king' then BCount+5 else BCount + 17 end;** " will:
   a. Nothing will happen because this statement is wrong in syntax.
   b. The BCount value will change by adding 17 to each record because of the else clause.
   c. The BCount value will add 20 for all queen bed size, 5 for all king size and 17 for the other sizes.
   d. The BCount value will add 20 for all queen bed size, (20+5) for all king size and (20+5+17) for the other sizes.

Both a and c are correct

10. Given that this databases is created correctly in the database with all foreign keys and primary keys, which of the following will execute correctly:
    a. Delete table patient;
    b. Drop table treats;
    c. Remove table doctor;
    d. All of the above will execute and the tables will no longer be in the database.
    ****

Q5: (10 pnts) Study this ERM and answer the following based on your relational algebra knowledge:
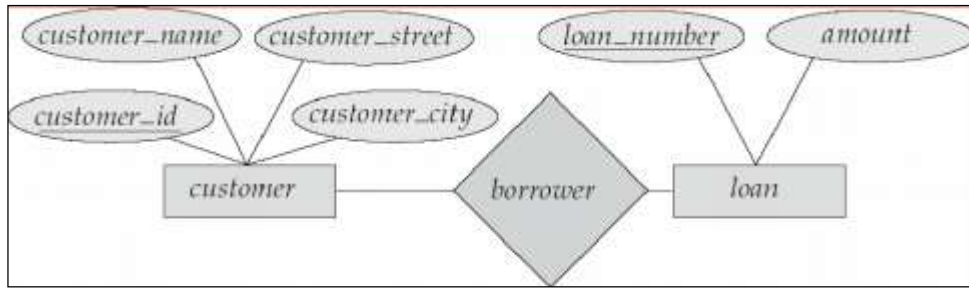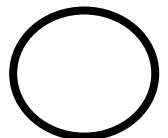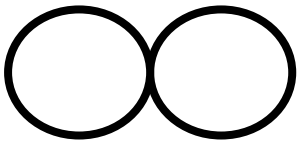
End of Exam

Good Luck!

Or any acceptable form: 2 pnts, 1 pnts, and 0 pnt.

Question (2pnts each)	Your Answer
Write a relational algebra statement to find the loan numbers (loan_number) for the loan having an amount less than 500. [Hint: use both projection (Π) and selection (σ) operators].	$\Pi_{loan\_number} (\ \sigma_{amount<500} (loan))$
Write a relational algebra statement to find the sum of loan amounts in the loan relation. [Hint: use the aggregate function (g) operator].	$g_{sum(amount)} (loan)$
Write the outcome of this expression $Customer\_city\ g\ count(customer\_id)$ **(Customer)**	**Number of customers grouped by their cities.**
Write a relational algebra statement to find all customer names, their loan IDs, and the amounts. [Hint: use projection (Π) and product (x) operators].	$\Pi customer\_name,loan\_number,amount(\ (customer\ x\ borrower)\ x\ loan)$
Write a relational algebra statement to find the intersection between Customer IDs in both Customer and borrow relations. [Hint: use projection (Π) and intersection (∩) operators].	$\Pi customer\_id(borrower)$ $\cap \Pi customer\_id(customer)$ $\Pi customer\_id(borrower \cap customer)$

Exam 02 – 2011 Form 2

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Name (Print CLEARLY):………………………………..

StID:……………………

Q1: (15 pts) Study the following form for a trading company that sells wholesale grocery items. Based on this form, create a database in the 3rd normal form by following the normalization rules step-by-step. [Hint, consider the SaleID as your primary key].

SALE FORM	
Sale ID:	**6590-JHGZX-54F**
Sale Date:	March 6th, 2008

Buyer Information			**Clerk information**	
Buyer ID:	BYT-6598		**Clerk ID:**	CLK-7658
Buyer Name:	Emad hamid		**Clerk Name:**	Ameen Khalid

Items information				
Item ID	**Item Description**	**Unit Price**	**No of boxes**	**Sub-total**
TM-76543	A4 paper	3.0	50	150
TM-53679	Paper Towels	2.5	100	250
TM-56788	Paper clips	0.5	150	75
Total				JD 1150

Step 0: Plain Table with primary key

SaleID, SaleDate, BuyerID, BuyerName, clerkID, clearkName, ItemID, ItemDescription, UnitPrice, NoBoxes

(5 pts) Step1: 1st Normal Form: Show all tables (Hint: Remove repeating groups if exist)
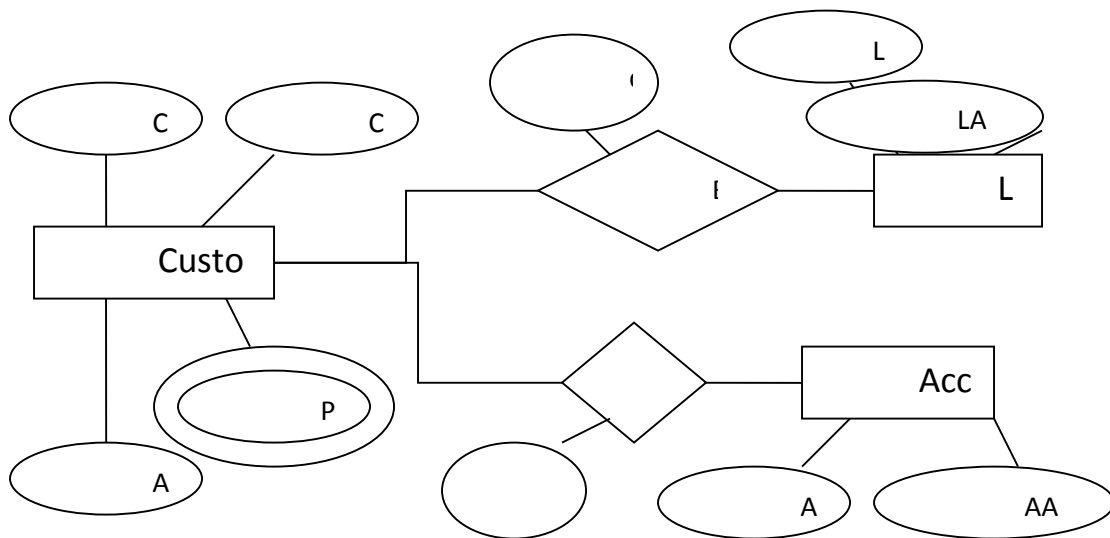
(5 pts) Step 2: 2nd Normal Form: Show all tables (Hint: Remove partial dependencies if exist).

(5 pts) Step 3: 3rd Normal Form: Show all tables (Hint: Remove transitive dependencies if exist).

**Q3: (10 pts) Study the following ERM and answer questions below (2pnts each)**

6. The SQL statement that retrieves all customer names (**without** duplication) who had a loan is:
   e. select distinct **custName** from **customer**, **borrow**;
   f. select distinct **custName** from **customer** where **LID** in (select **LID** from **loan**);
   g. select distinct **custName** from **customer** where **CID** in (select CID from **borrow**);
   h. a + c

7. The SQL statement that retrieves all customer names with accounts having an amount over JD50000 (**without** duplication) is:
   e. select distinct **custName** from **customer**, **account** where AAmount > 50000;
   f. select distinct **custName** from **customer** where **CID** in (select **CID** from **has**, **account** where **has.LID** = **account.LID** and **AAmount** > 50000);
   g. select distinct **custName** from **customer**, **has** where **AAmount** > 50000;
   h. b + c

8. The SQL statement that retrieves the **summation** of all borrowed loans is:
   e. select **LAmount** from **loan** where **LID** in (select **LID** from **borrow**);
   f. select **sum, LAmount** from loan, borrow where loan.LID = borrow.LID;
   g. select **sum**, **LAmount** from loan where LID in (select LID from borrow);

h. None of the above.
9. The SQL statement that retrieves all loan transactions occurred on April 1st, 2009:
   e. select * from **loan** where **date1** = '01-April-2009';
   f. select **L.LID**, **L.LAmount**, **B.date1** from **loan** L, **borrow** B where **L.LID** = **B.LID** and **B.date1** = '01-April-2009';
   g. select **L.LID**, **L.LAmount** from **loan** as L where **LID** in (select **LID** from **borrow** where **date1** = '01-April-2009');
   h. b + c
10. The SQL statement that retrieves customer IDs, average loan amounts grouped by the CIDs:
   e. select **CID**, **CName** from **customer** C , **loan** L, **borrow** B where **C.CID** = **B.CID** and **B.LID** = **L.LID** and **L.LAmount** = avg(**L.LAmount**);
   f. select **B.CID**, avg(**L.LAmount**) from **loan** L, **borrow** B where **B.LID**=**L.LID** group by **B.CID**;
   g. select **CID**, **CName** from **customer** C where **CID** in (select **CID**, avg(**L.LAmount**) from **borrow** B, **loan** L where **B.LID** = **L.LID** group by **B.CID**;
   h. None of the above   *Proceed to Page 4*

   **Q4: (10 pnts)** Given this ERM, Answer the following **(1 pnt each)**:
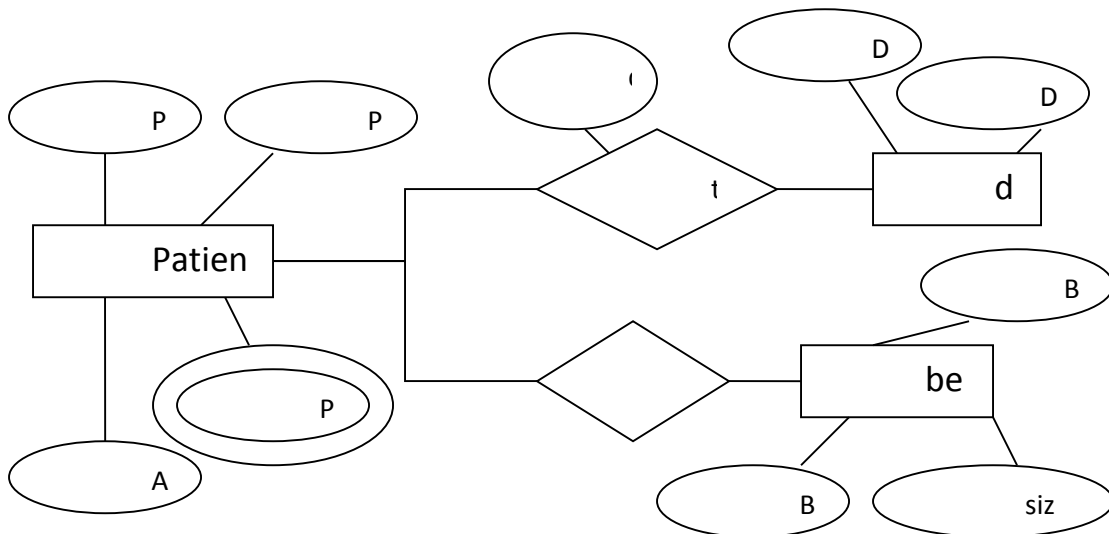
11. The SQL statement " **select P.PName, Ph.PhNo from Patient P, PatientPhones Ph where P.PID = Ph.PID;**" retrieves:
   e. All patient information and their phone numbers;
   f. Patient names and and only one phone number.
   g. All Patient names and all phone numbers.
   h. This statement is wrong.
12. The SQL statement " **(select P.PID from Patient P) union (select T.PID from treats T);**" retrieves:
   e. All patient IDs regardless of receiving a treatment or not.
   f. All patients who have been treated by a doctor.

g. Some of the patients who have been treated by a doctor.

h. None of the above.

13. The SQL statement " **select P.PName from Patient P where P.PID in (select U.PID from Uses U) intersect (select T.PID from treats T);**" retrieves:

   e. All patient names who received treatment and used a bed.

   f. All patient names who used a bed but did not receive a treatment.

   g. All patient names who received a treatment but did not use a bed.

   h. None of the above.

14. To create the table **uses**:

   e. Create table uses (PID varchar2(20), BID varchar2(20), primary key(BID, PID));

   f. Create table uses (PName varchar2(20), BID varchar2(20), primary key(BID));

   g. Create table uses (PID varchar2(20), BID varchar2(20), primary key(PID,BID), foreign key(PID) references (PID), foreign key(BID) references (BID));

   h. None is correct.

15. To create the table **doctor**:

   e. Create table doctor (DID varchar2(20), Dname varchar2(50), primary key(DID));

   f. Create table doctor (DID varchar2(20), Dname varchar2(50) not null, primary key(DID), foreign key (DID) references treats(DID));

   g. Create table doctor (DID varchar2(20), Dname varchar2(50) not null, primary key(DID));

   h. a + c are both correct.

Proceed to Page 5

16. The statement "**update bed set size = 'queen'** " will

   e. Add an attribute size to the table **bed** and set the default value to 'queen'.

   f. Set the default value for any new inserted **bed** record to 'queen'

   g. Set all the values for each record in the table **bed** to 'queen'

   h. b + c are both correct

17. The statement "**insert into patient(PID, Address, PName) values ('0001','Amman', 'Ahmad')** " will

   e. Add three attributes to the table patient.

   f. Add one record to the table patient with an ID = '0001' but leaves both the address and PName empty because they are not in order.

   g. Add one record to the table patient with an ID = '0001', address = 'Amman', Name = 'Ahmad'

   h. Either b or c might happen depending on the SQL version you are using.

18. The statement "**drop table bed where BID = '0001'** " will:

   e. Drop all the record with ID = '0001'

   f. Drop all the database

   g. Drop the tables bed and uses because they depend on each other.

   h. This statement is wrong in syntax.

19. The statement " **update bed set BCount = case when size='queen' then BCount + 20 when size='king' then BCount+5 else BCount + 17;** " will:

   e. Nothing will happen because this statement is wrong in syntax.

f. The BCount value will change by adding 17 to each record because of the else clause.
g. The BCount value will add 20 for all queen bed size, 5 for all king size and 17 for the other sizes.
h. The BCount value will add 20 for all queen bed size, (20+5) for all king size and (20+5+17) for the other sizes.

20. Given that this databases is created correctly in the database with all foreign keys and primary keys, which of the following will execute correctly:
    e. Delete table patient;
    f. Drop table treats;
    g. Remove table doctor;
    h. All of the above will execute and the tables will no longer be in the database.

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Q5: (10 pnts) Study this ERM and answer the following based on your relational algebra knowledge:

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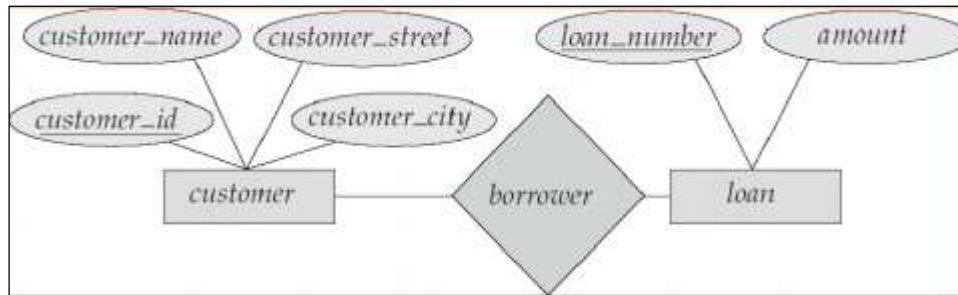
End of Exam

Good Luck!

Question (2pnts each)	Your Answer
Write a relational algebra statement to find the loan numbers (loan_number) for the loan having an amount less than 500. [**Hint: use both projection (Π) and selection (σ) operators**].	
Write a relational algebra statement to find the sum of loan amounts in the loan relation. [**Hint: use the aggregate function (ϑ) operator**].	
Write the outcome of this expression $_{\text{Customer\_city}}\vartheta_{\text{count(customer\_id)}}$ **(Customer)**	
Write a relational algebra statement to find all customer names, their loan IDs, and the amounts. [Hint: use projection (Π) and product (x) operators].	
Write a relational algebra statement to find the intersection between Customer IDs in both Customer and borrow relations. [Hint: use projection (Π) and intersection (∩) operators].	