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University of Jordan
 Department of Information Systems
 Database Mid-Term Exam 1902231 13/11/2007

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 رقم الطالب: _____

Question 1 (7 pts): A university registrar deals with the following entity sets and relationship sets.

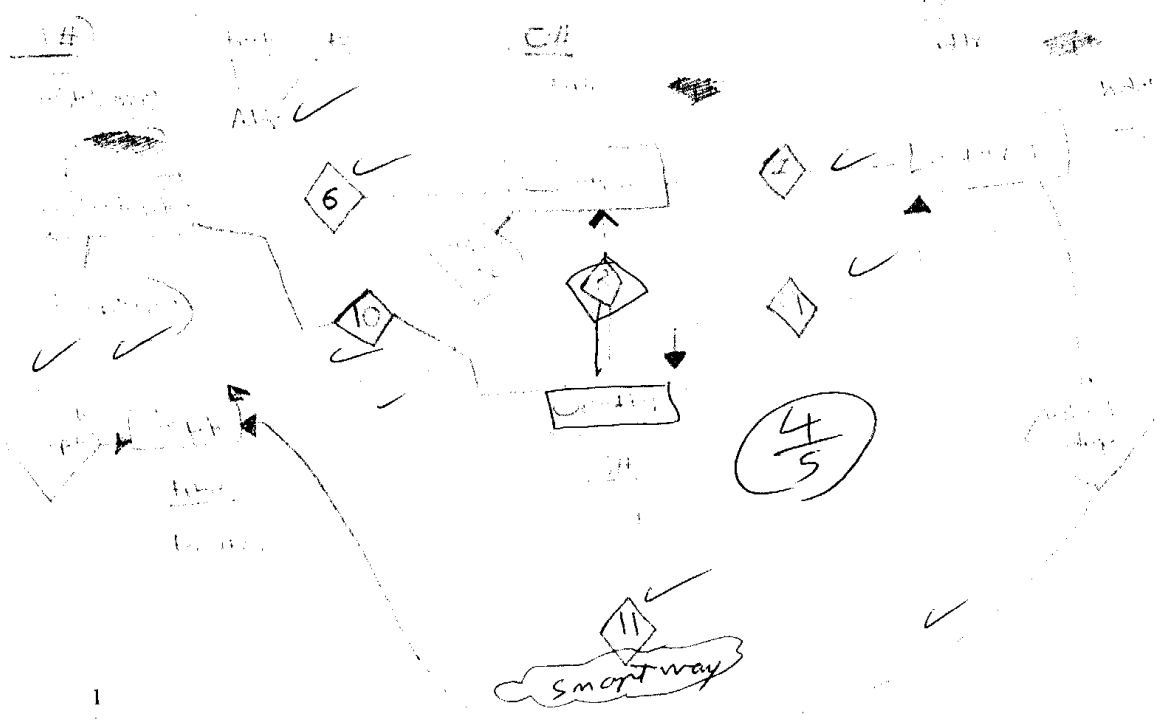
5/4

1. student: every students has number, name, department, address and telephone number.
2. course: every course has a number, title, department.
3. lecturer: every lecturer has a name, address, department, hiring date (تاريخ التعيين), and title (Dr., Prof., Mr. or Mrs.).
4. section: every section has a number (just a serial number), capacity (السعة).
5. department: with title, location
6. students take courses
7. courses are taught by lecturers
8. a course consists of many sections
9. a section is assigned a lecturer.
10. students register in sections
11. students are taught by lecturers.

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 حسب رتبها للسهولة

a) Use entity relationship model to model the above problem. Use the same cardinality assumptions that are made by the University of Jordan.

Important: Your model must contain at least one multi-valued attribute, one composite attribute and you must underline the primary keys.

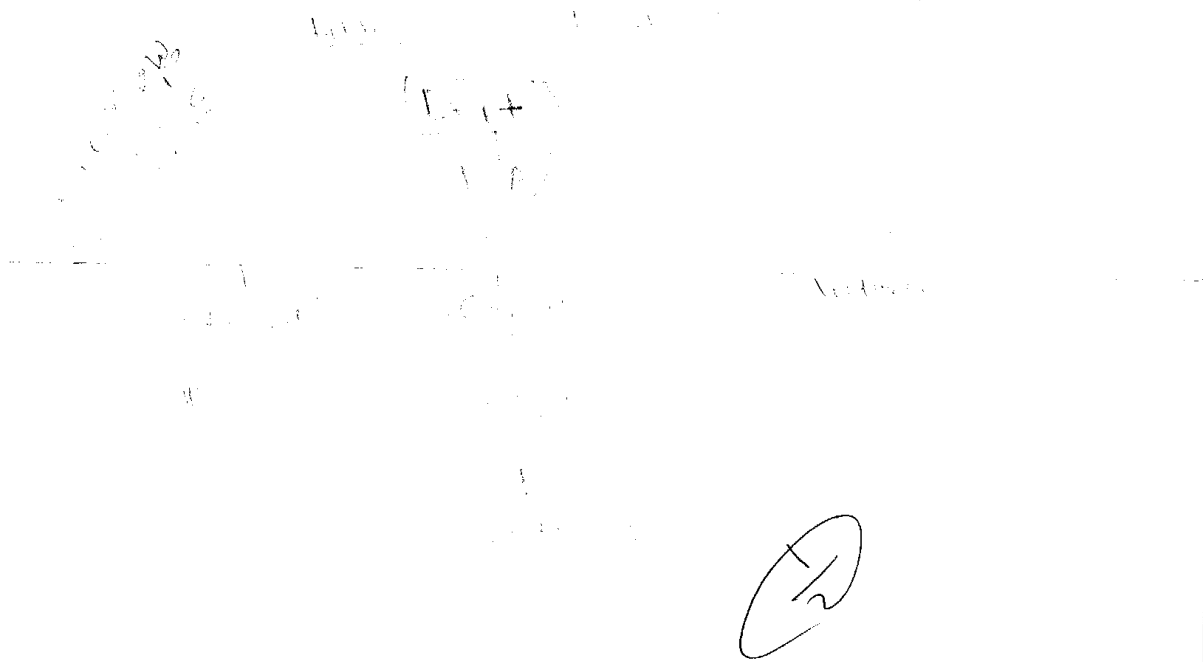


b) What entities can be modeled by generalization (or specialization) in the above model? And what are the advantage(s) for doing so?

1] Department entity because it is common between all entities, and this may help us in Redundancy avoidance & Simple the hierarchy.

2] Courses entity ~~can be~~

c) Draw an entity relationship diagram, to model the entities you mentioned in (b).



Q2) (8 pts)

You will need the following structures:

DEPT

EMPLOYEE

Name	Null?	Type	Name	Null?	Type
deptno	not null	number(2)	empno	not null	number(4) → integer int.
dname		varchar2(14)	ename		varchar2(10)
loc		varchar2(13)	job		varchar2(9)
			mgr		number(4) → integer int
			hiredate		date
			sal		number(7,2)
			comm		number(7,2)
			deptno	not null	number(2) → integer int. Small integer

a) Write SQL commands to create the two tables (DEPT and EMPLOYEE).

SQL> Create table DEPT (
 deptno number(2) not null,
 dname varchar2(14),
 loc varchar2(13))
 Create table EMPLOYEE (
 empno number(4) not null, ename varchar2(10),
 job varchar2(9), mgr number(4),
 hiredate date, sal number(7,2),
 comm number(7,2), deptno number(2) not null).

you should put PK constraint

b) Write an SQL query to retrieve the names of all employees who work at the CS department (i.e dname = CS)

SQL> Select ename From EMPLOYEE, DEPT
 where DEPT.dname = 'CS'
 and DEPT.deptno = EMPLOYEE.deptno

c) Write an SQL query that retrieves the number of employees at each department

Select dname, count(ename)
 from DEPT, EMPLOYEE
 where DEPT.deptno = EMPLOYEE.deptno
 group by dname

Q3 Multiple choices questions (10 PNTS)

- 1) In the database design arena, a ____ is used to represent real-world problem.
a. data record c. data model
b. data design d. conceptual design
- 2) The concept of a(n) ____ is the most fundamental concept of the ER modeling grammar.
a. type c. domain
b. class d. entity
- 2) An entity or entity instance is created when a value is supplied for some ____ (s).
a. domain c. object type
b. data set d. attribute
- 3) An attribute can be either a stored attribute or a ____ attribute.
a. temporary c. saved
b. placeholder d. derived
- 3) In ER-diagrams a multi-valued attribute can be mapped into ____.
 a. A separate table. c. one attribute in the same table
b. many tables d. Many derived attributes
- SV: one → many
- 4) A binary relationship between the two entity types, 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 c. 1:n
 b. n:1 d. m:n
- 5) 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 c. integral
b. partial d. total
- 6) A weak entity is defined to be ____
a. An entity that has enough attributes to construct a primary key. c. Existence independent
b. has no Discrimination d. None of the above
- 7) An entity set cannot exist without ____.
 a. at least one attribute c. a composite key
b. at least one relationship d. several attributes
- 8) A business rule states that an employee may be supervised by another employee. This is an example of a(n) ____ relationship.
a. self-entity c. recursive
 b. circular d. indirect
- 9) A business rules states: "Since a dependent cannot exist independently of an employee, the dependent name and relationship to the employee, in conjunction with the employee name is used to identify the dependents of an employee."
Accordingly, a dependent should be modeled as a ____.
 a. weak entity c. relationship type
b. total entity d. weak relationship
- 10) Entities that belong to a subclasses also belong to the ____.
a. Has-a class c. aggregate
 b. superclass d. lattice
- 11) A ____ constraint means that an entity of the superclass cannot be a member of more than one subclass of the specialization.
a. completeness c. participation
b. uniqueness d. disjointness

- 12) Using the process of generalization the designer would begin by observing a number of ____.
- a) common attributes
 - b. common entities
 - c. defining values
 - d. defining predicates

- 13) A domain is
- a) A set of values that a field may have
 - b) A set of values that a record may have
 - c) A set of values that a row may have
 - d) None of the above

The following is the structure of the CUSTOMERS table

Oracle SQL*Plus		
Name	Null?	Type
CUSTOMERS	NOT NULL	NUMBER(4)
LASTNAME		VARCHAR2(10)
FIRSTNAME		VARCHAR2(10)
ADDRESS		VARCHAR2(20)
CITY		VARCHAR2(12)
STATE		VARCHAR2(2)
ZIP		VARCHAR2(5)
REFERRED		NUMBER(4)

14) Which of the following commands will add a new column named FIRSTORDERDATE to the CUSTOMERS table to store the date that the customer first placed an order with the company?

- a. CREATE COLUMN firstorderdate, DATE TO customers; x
- b. ALTER TABLE customers ADD ROW firstorderdate DATE; x
- c. ALTER TABLE customers ADD firstorderdate TIME;
- d. ALTER TABLE customers ADD firstorderdate DATE; ✓

15) Which of the following commands will display all tuples in the CUSTOMERS table?

- a. DISPLAY * FROM CUSTOMERS;
- b. SELECT * FROM CUSTOMERS; ✓
- c. SELECT * FROM CUSTOMERS WHERE CUSTOMER# = ALL;
- d. SELECT * FROM TAB;

16) Which of the following DDL commands will SHOW all columns and their data type in the CUSTOMERS table?

- a. DESCRIBE * FROM CUSTOMERS;
- b. DESCRIBE CUSTOMERS; ✓
- c. SELECT * FROM CUSTOMERS ;
- d. DESCRIBE * FROM TAB; ✓

17) A DELETE statement of the form ____ can be used to delete all rows in a table.

- a. DELETE *
- b. DELETE FROM <table-name> ✓
- c. DELETE * FROM <domain>
- d. DELETE * FROM <table-name>

The following is the contents of the PUBLISHER table:

Oracle SQL*Plus			
PUBID	NAME	CONTACT	PHONE
1	PRINTING IS US	TOMMIE SEYMOUR	000-714-8321
2	PUBLISH OUR WAY	JANE TOMLIN	010-410-0010
3	AMERICAN PUBLISHING	DAVID DAVIDSON	800-555-1211
4	READING MATERIALS INC.	RENEE SMITH	800-555-9743
5	REED-N-RITE	SEBASTIAN JONES	800-555-8284

18) Which of the following commands will delete only publisher 4 from the PUBLISHER table?

- a. DELETE FROM publisher;
- b. DELETE pubid = 4 FROM publisher;
- c. DROP FROM publisher WHERE pubid = 4;
- d. DELETE FROM publisher WHERE pubid = 4; ✓

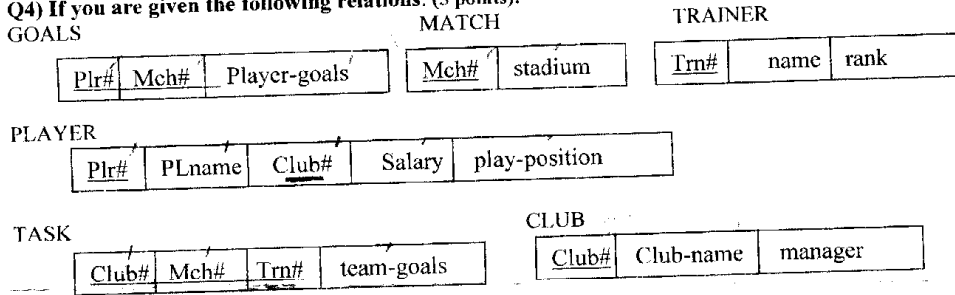
19) Based on the contents of the PUBLISHER table, which of the following will add a new record to the table?

- a. INSERT INTO publisher
VALUES ('BOOKS MADE CHEAP', '800-111-2222');
- b. INSERT INTO publisher (pubid, name)
VALUES (6, 'BOOKS MADE CHEAP');
- c. UPDATE publisher
VALUES ('BOOKS MADE CHEAP', '800-111-2222');
- d. UPDATE publisher (pubid, name)
VALUES (6, 'BOOKS MADE CHEAP');

20) 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

Q4) If you are given the following relations: (5 points):



Draw ERM diagram of the above relations.

