四川大学期末考试试题（闭卷）

（2016~2017 学年第 2 学期）

课程号：**311038040** 课程名称：**数据库系统（A 卷）** 任课教师：**张天庆、龚勋、屈立笳**

适用专业年级：**软件工程 2015 级** 学号：_____ 姓名：_____

考试须知

四川大学学生参加由学校组织或由学校承办的各级各类考试，必须严格执行《四川大学考试工作管理办法》和《四川大学考场规则》。有考试违纪作弊行为的，一律按照《四川大学学生考试违纪作弊处罚条例》进行处理。

四川大学各级各类考试的监考人员，必须严格执行《四川大学考试工作管理办法》、《四川大学考场规则》和《四川大学监考人员职责》。有违反学校有关规定的，严格按照《四川大学教学事故认定及处理办法》进行处理。

题　　号	1	2	3	4	5				卷面成绩
得　　分									
阅卷时间									

注意事项：1. 请务必将本人所在学院、姓名、学号、任课教师姓名等信息准确填写在试题纸、答题纸和添卷纸上；

2. **请将答案全部填写在答题纸上；**

3. 考试结束，请将试题纸、答题纸、添卷纸和草稿纸一并交给监考老师。

评阅教师	本题得分

(1)	(2)	(3)	(4)	(5)

1. Multiple Choices. (Total marks: 10)

(1) Please select the right option/options. (　　)

A. Every cell is an atomic (single) value. B. An attribute values are from the same domain. C. The order of attributes has no significance. D. Each tuple is distinct.

(2) Please select the right option/options. (　　)

A. A view permits users to access data in a customized way.

B. A view is a base relation.

C. A view can simplify complex operations.

D.A view can hide parts of database from certain users.

(3) In a relation, no attribute of a primary key can be null. Which of the following option/options is/are related to the above statement? (　　).

A. Entity Integrity　　B. Referential Integrity　　C. Enterprise constraints　　D. Super key

(4) The data in the database can be queried, inserted, deleted, modified (Updated), because the database management system provides (　　).

A. data definition function　　B. data manipulation function　　C. data maintenance function　　D. data control function

(5) Assuming that the student relationship is S (studentNo, name, gender, age), the course is C (courseNo, course name, teacher), and the course selection is SC (studentNo, courseNo, grade). Which relationships are be used to find the names of the female students who take the course of the database. (　　)

A. S　　B. SC, C　　C. S, C, SC　　D. S, SC

评阅教师	本题得分

2. Relational Algebra and SQL statements. (Total marks: 41)

The database is as follows:

Students (studentNo, studentName, sex, major, scholarships)
Course (courseNo, courseName, credit)
Learning (studentNo, courseNo, score)

To achieve the following 1 - 4 questions with **the relational algebra expression**:

1) Find the information of English major students, including the number of students, names, the names of courses, and grades. **(Marks: 5)**

2) Find the number of students, names, majors and scores of the students whose scores of "database principle" course are above 90. **(Marks: 5)**

3) Find the information about students who do not take the course number "C135", including the number of the students, names and majors. **(Marks: 5)**

4) Find the information of all students who have not failed any course, including the number of the students, names and majors. **(Marks: 5)**

To achieve the following 5 - 8 questions in SQL language:

5) Find the information about students who do not take the course number "C135", including the number of the students, names and majors. **(Marks: 5)**

6) Find the information about students who take the course numbers "C135" and "C219", including the number of the students, names and majors. **(Marks: 5)**

7) Delete all information of the students with 0 marks from the student table form. **(Marks: 5)**

8) Define a view AAA of students majoring in English, including the numbers of the students, names, the numbers of courses and scores. **(Marks: 6)**

评阅教师	本题得分

3. Normalization. (Total marks: 24)

There is a relational schema in a business group database, R as follows:

R (shop number, commodity number, quantity of goods in stock, department number, department head)

Provided that:
Each shop in each store is sold only in one department of the store.
Each department in the store has only one manager.
Each store has only one inventory of each item.

Please answer the following questions:

1) Write the function dependencies of the relational schema R. **(Marks: 6)**
1) Find the candidate keys of the relational schema R. **(Marks: 6)**
2) Which **normal form** is the relation shown above in? **Why**? **(Marks: 6)**
3) If the relation is not in **3NF**, bring it to **3NF** relations; specify primary keys and referential integrity constraints, using directed arcs, for each relation. **(Marks: 6)**

评阅教师	本题得分

4. Database Design (Total marks: 25)

A library management system has the following information:

Book: ISBN, title, number, position

Borrower: library-card No, name, Department

Publisher: PublisherName, Postcode, address, phoneNo, E-mail

The agreement:

- The ISBN of a book is unique.
- The number of a library card is unique.
- The name of a publisher is unique.
- The "position" is the position of the library where a book is stored.
- Anyone can borrow more than one book.
- A book can be borrowed by more one borrower.
- The corresponding registration date and return date should be input, when a borrower borrows or returns books.
- A publisher can publish a variety of books.

- A book is only published by one publisher.

According to the above situation, complete the following design:

1) Design the **E-R diagram** of the system. **(Marks: 10)**

   Note: mapping **cardinality** of each relationship and **participation** of each entity to the relationship should be described in the diagram.

2) Transform the E-R diagram into **relational schema**. **(Marks: 10)**

3) Give **the relational keys (primary keys, foreign keys)** of each relational schema, **using directed arcs**. **(Marks: 5)**

注：试题字迹务必清晰，书写工整。

教务处试题编号：311－34