Quiz

course name　database principle　　examination time　45minutes

student number＿＿＿＿＿＿＿＿　　student name＿＿＿＿＿＿＿＿

1. Please briefly answer the following questions: (8+8+8+8=32)
   a) Explain the difference between files and Databases;
   b) What's ANSI-SPARC Architecture and how it supports data independence?
   c) Explain the difference between Data, Data model and Data Schema;
   d) Explain the four parts of SQL;

2. The following relational modes are given: R = (A, B, C), S = (D, E, F). Let the relations r(R) and s(S) be known. Please give the tuple relational calculus expression equivalent to the following expression: (8+10+13=31)
   a) $\prod_A(r)$
   b) $\prod_{A,F}(\sigma_{C=D}(r \times s))$
   c) $r * \bowtie_{C=D} s$

3. Please draw the E-R diagram of the project relationship, the entities including employee, project, supplier, component. The relationship between the entities are as follows: (15)
   a) A project has multiple employees, and one employee can only work in one project;
   b) A project has multiple suppliers, and one supplier can supply multiple projects;
   c) A project requires multiple components, which can come from the same supplier or from different suppliers, and one kind of components can be used by multiple projects.
   Note: The entries have been given, please draw the E-R diagram that correctly represents these entities' relationships.

project	employee	supplier	component

4. There is a work relationship table and the data schema is as follows:
   　　Work(warehouseID, employeeID, componentID, quantity)
   　One warehouse has multiple employees, and each employee only works in one warehouse. In each warehouse, one type of components is composed of one employee is responsible, but one employee can be responsible for a variety of components.
   　Analyze all possible candidate keys for this pattern. (8)

5. Answer these questions according to the tables:(6+8=14)
   a) Give the query result of "SELECT B.bname, R.day FROM Boats B, Reserves R WHERE B.bid=R.bid AND B.color=red";
   b) Write an SQL statement to query the names of sailors who've reserved green boat.