

國立交通大學 106 學年度碩士班考試入學招生試題

科目：管理資訊系統 (5082)

考試日期：106 年 2 月 9 日 第 3 節

系所班別：資訊管理與財務金融學系

組別：資管碩乙組

第 1 頁, 共 2 頁

【不可使用計算機】*作答前請先核對試題、答案卷(試卷)與准考證之所組別與考科是否相符!!

1. (12%) Below is a subset of relations from COMPANY schema. The keys have been underlined.

EMPLOYEE(EMPNAME, EmpID, ADDRESS, SALARY, SupervisorEmpID, DNUMBER)

DEPARTMENT(DNAME, DNUMBER, MANAGERID)

WORKS_ON(EmpID, PNUMBER, HOURS)

PROJECT(PROJNAME, PNUMBER, DNUMBER)

In a company, each employee works for a department and may work on several projects. The EMPLOYEE table also keeps track of the direct supervisor of each employee. Supervisors are also employees. An employee (supervisor) may be the direct supervisor of several employees. A department controls several projects. A project is controlled by a department. Express the following Query in SQL statement. You also need to clearly draw the tables and the join relationships between the tables used in your SQL statement.

Query: For each employee who does not work for the "MIS" department but works on more than five projects controlled by the "MIS" department, list the name of the employee and the name of his/her supervisor.

2. Suppose that we have an ordered file with $r = 60,000$ records stored on a disk with block size $B = 1024$ bytes. File records are of fixed size with record length $R = 100$ bytes.

(a) (4%) How many block accesses would be needed to do a binary search on the data file? How many block accesses in average would be needed to do a linear search for non-ordering field on the data file?

(b) (4%) Assume that we have constructed a primary index for the file that the ordering key field of the file is 10 bytes long and a block pointer that is 10 bytes long. What's the total number of blocks needed for the index file? How many block accesses would be needed to search for a record using the primary index?

(c) (4%) Assume that we have constructed a secondary index on a non-ordering key field of the file that is 10 bytes long and a block pointer that is 10 bytes long. What's the total number of blocks needed for the index file? How many block accesses would be needed to search for a record using the secondary index?

3. (a) (4%) What is a functional dependency? Assume that K is a key of a relation R . Does K functionally determine all attributes in R ? Explain Why?

(b) (5%) Explain how a SQL query is processed by using the library of function calls approach for accessing a database through a programming language. You need to explain how to handle a SQL statement string (the query string) and the parameters in the query string. Give an example to aid your explanations.

國立交通大學 106 學年度碩士班考試入學招生試題

科目：管理資訊系統 (5082)

系所班別：資訊管理與財務金融學系

考試日期：106 年 2 月 9 日 第 3 節

組別：資管碩乙組

第 2 頁, 共 2 頁

【不可使用計算機】*作答前請先核對試題、答案卷(試卷)與准考證之所組別與考科是否相符!!

4. Explain the business value of SCM and CRM (10%)
5. Explain crowdsourcing and crowd wisdom and their role in e-commerce (12%)
6. Explain the platform economy and business model (11%)
7. What are data warehouse, data mining, and big data? (15%)
8. Why is big data important to a business firm? (9%)
9. What is a smart hospital? (10%)