

編號：E353 系所：會計學系乙組

科目：資料庫管理系統

本試題是否可以使用計算機： 可使用， 不可使用（請命題老師勾選）

一 選擇題（每題 3 分）

- 1) A database system contains not only the database itself but also a complete definition or description of the database structure and constraints. The latter is often store in a _____.
 - A. data warehouse
 - B. data model
 - C. system catalog
 - D. none of the above
- 2) Which of the following is not provided by typical DBMS to help database users manage and use a database?
 - A. controlling redundancy
 - B. managing virtual memory
 - C. enforcing integrity constraints
 - D. restricting unauthorized access
- 3) In which of the following databases can users define operations on data as part of the database definitions?
 - A. Relational database
 - B. Hierarchical database
 - C. Network database
 - D. Object-oriented database
- 4) In many DBMSs, DBA uses which of the following languages to define conceptual and internal schemas?
 - A. Data definition language
 - B. Procedural language
 - C. Functional language
 - D. None of the above
- 5) A relationship between the instances of one entity type is called a(n) _____ relationship.
 - A. binary
 - B. unary
 - C. ternary
 - D. primary
- 6) If you want to eliminate duplicate tuples when wring a SQL query, which of the following keyword must be used in the SELECT clause?
 - A. UNIQUE
 - B. DISPARATE

*背面仍有題目,請繼續作答)

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C. NO DUPLICATES

D. DISTINCT

- 7) We use GROUP BY clause in SQL to partition tuples into groups. If we want every resulting group to satisfy certain condition, which SQL clause is needed?
- A. SATISFY
B. SUCH THAT
C. HAVING
D. WITH
- 8) Which of the following relational algebra operators is especially useful to express the following kinds of queries: Find the names of students who have taken all courses offered by Professor Lee?
- A. Union
B. Join
C. Selection
D. Division
- 9) Why is tree-based indexing in widespread use?
- A. It supports equality selection and range selection efficiently.
B. It is easy to use.
C. It is better than hash index in every respect.
D. None of the above
- 10) What is the selectivity of an access path in query evaluation?
- A. Relevance of pages retrieved with respect to our query
B. Number of pages retrieved if we use this access path to retrieve all desired tuples
C. Number of records retrieved if we use this access path to retrieve all desired tuples
D. None of the above

二 For each of the terms in the left-hand column below, select the term in the right-hand column that best matches it. (每題 3 分)

- | | |
|------------------------------|---|
| 1. _____ Page | A. Isolation |
| 2. _____ Fan-out | B. read data into memory/write data to disk |
| 3. _____ LRU | C. Unit of information read from or written to disk |
| 4. _____ Intersection | D. Equal-size data partitions over multiple disks |
| 5. _____ Buffer manager | E. NOT NULL |
| 6. _____ Data striping | F. Relational algebra operator |
| 7. _____ Insertion anomalies | G. Number of children for a non-leaf node |

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8. ____ Primary index H. Normalization
9. ____ Serializability property I. Page replacement policy
10. ____ Primary key J. Includes the primary key

三 問答題

1. Describe each of the following terms: A. Program-data independence; B. Data model; C. Index-only evaluation; D. Projection operator in relational algebra; E. Armstrong's Axioms. (共 15 分)
2. What does it mean that two relation instances are union-compatible? (4 分)
3. Suppose we want to describe employees in a company and their addresses using the entity-relationship diagram. We use an entity to represent employees. We could model address either as an attribute of employee or as a separate entity. Describe one condition under which address must be modeled as an entity. (4 分)
4. When we translate an ER diagram to a relational database schema, the standard approach is to map each entity set to a relation and each relationship set to a relation as well. Sometimes we choose to combine the relation for a relationship set and the relation for the entity with which the relationship associates into one relation. Answer the following questions:
 - A. For which type of relationship set do we make this decision, many-to-many or one-to-many? (2 分)
 - B. What advantage we may get for this decision? (3 分)
 - C. What is its drawback? (3 分)
5. We are given the following three tables. Answer the following questions:
 - A. Could we represent the constraint "every department must have at least one employee working in it" by modifying the following table definitions? (2 分)
 - B. If your answer is yes, modify the definitions to represent the constraint. If your answer is no, then describe one way to do it. (7 分)

```
create table Employees (ssn char(11),  
                        name char(20),  
                        primary key(ssn))
```

```
create table Departments (did char(8),
```

(背面仍有題目,請繼續作答)

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```
name char(20),  
primary key(did))
```

```
create table Works_In (ssn char(11),  
did char(8),  
primary key(ssn,did),  
foreign key (ssn) references Employees,  
foreign key (did) references Departments)
```