

國立臺北科技大學

九十六學年第二學期電機系博士班資格考試

資料庫試題

填學生證號碼

第一頁 共一頁

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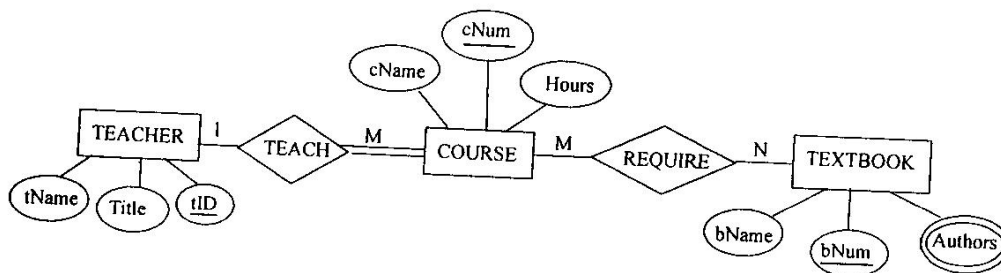
注意事項：

1. 本試題共 **(9)** 題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。
4. 考試時間：二小時。

Before beginning to answer a question make sure that you read it carefully. If you are confused about what the question means, state any assumptions that you make in formulating your answer.

1. For each of the following sets of sentences, draw the corresponding ER diagram.
 - (a) (5%) A lecturer teaches, at most, one course. A course is taught by exactly one lecturer.
 - (b) (5%) A purchase order may be for many products. A product may appear on many purchase orders.
 - (c) (5%) A customer may submit many orders. An order is for exactly one customer.
 - (d) (5%) An account can be charged against many projects, though it may not be charged against any. A project must have at least one, though it may have many, accounts charged against it.
2. (10%) Design a relational database schema corresponding to the above ER diagram. Remember to indicate the primary key of each relation schema and all referential-integrity constraints (foreign-key constraints) between the relation schemas.
3. (10%) Describe the wait-die and wound-wait protocols for deadlock prevention.
4. (10%) Explain how MySQL prevent the deadlock from occurring?
5. (10%) What is a cascadeless schedule? Why is cascadelessness of schedules desirable?

6. (10%) Consider the ER diagram of the following figure, which shows a simplified course database. Extract from the ER diagram the requirements and constraints that produced this schema.



7. (10%) A PARTS file with Part# as hash key includes records with the following Part# values:
 97, 1, 90, 5, 19, 51, 35
 The file uses 4 buckets, numbered 0 to 3. Each bucket is one disk block and holds 2 records.
 Load these records, into the file in the given order using the hash function $h(K) = K \bmod 4$.
 Calculate the average number of block accesses for a random retrieval on Part#.
8. (10%) Consider the following relations for a database that keeps track of student enrollment in courses and the books adopted for each course:
 STUDENT(Ssn, Name, Major, Bdate)
 COURSE(Course#, Cname, Dept)
 ENROLL(Ssn, Course#, Quarter, Grade)
 BOOK_ADOPTION(Course#, Quarter, Book_isbn)
 TEXT(Book_isbn, Book_title, Publisher, Author)
 Specify the foreign keys for this schema, stating any assumptions you make.
9. (10%) Consider the following two sets of functional dependencies $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$ and $G = \{A \rightarrow CD, E \rightarrow AH\}$. Check whether or not they are equivalent.

