



7 ข้อ = 180 marks

1 ข้อ = 26 marks

1 ข้อ = 2 ข้อ จริง

3 ข้อ = 180 marks

School of Engineering

King Mongkut's Institute of Technology Ladkrabang

Midterm examination, semester 2/2021

Wednesday 9 March 2022 at 13.30- 16.30

13016237 Information System and Database System By Prof. Dr. Suphamit Chittayasothorn

### Midterm Examination (Online)

Write answers using your handwriting on paper sheets. Submit your scanned answer sheets or their images to [suphamit.ch@kmitl.ac.th](mailto:suphamit.ch@kmitl.ac.th).

There are 7 questions (100 Marks). Do all of them.

Books and documents allowed. Computer and Internet Searching Allowed. No communications allowed.

set answer  
ข้อ 3, 4  
ข้อ 2

✓ 1. Given the Supplier-Part database with 3 separate table structures: S (S#, SNAME, CITY), P (P#, PNAME, COLOR), and SP (S#, P#, QTY).

Explain why should we use the 3 separate tables instead of combining them into only one big table SP' (S#, SNAME, CITY, P#, PNAME, COLOR, QTY)? (10 Marks)

✓ 2. Explain the 3 level database 3 level database Architecture in detail and show how this architecture can be implemented using the relational database model. (10 Marks)

✓ 3.

✓ 3.1 What is a relation? Show two representations of a relation.

✓ 3.2 What are the properties of a table which represents a relation?

✓ 3.3 Show two tables which are relations.

✓ 3.4 Show two tables which are not relations. (20 Marks)

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## Integrity rule

✓ 4. Give explanation of the following technical terms:

4.1 Super Key

4.2 Primary Key

4.3 Cost-based Query Optimizer

4.4 Data Independence

(20 Marks)

5.

✓ 5.1 What is the lossless join property? Give an example.

✓ 5.2 What is a join dependency, give 2 examples of tables with join dependencies, and a table without a join dependency. *BCNF (not 5NF), BCNF (in 5NF)*

✓ 5.3 Show a **BCNF** table which is not in the 5NF, and a BCNF table which is already in the 5NF.

Also explain why you think the tables have the property.

✓ 5.4 Give an example of a relation which is in 4NF but is not in 5NF. Explain why it has such property.

(20 Marks)

✓ 6. Given a table structure **CTX (COURSE, TEACHER, TEXT)**, explain if the table is in the 5NF or not, and give your support reasons. (10 Marks)

~~7. A supermarket would like to have a database for basic services. Details of products and suppliers are kept as well as details about member customers. Customer purchase records are to be kept as well. Design relational database schemas in 5NF for this application using the Entity Relationship Model and the Normalization Technique. Assume data items and relationships among them by yourself. (10 Marks)~~

*Supant*