Assignment 3

Deadline: 29/04/2017 @ 23:59

**[Total Mark for this Assignment is 4]**

***INTRODUCTION TO DATABASE***

***IT244***

**Instructions:**

* This Assignment must be submitted on Blackboard via the allocated folder.
* Email submission will not be accepted.
* You are advised to make your work clear and well-presented, marks may be reduced for poor presentation.
* You MUST show all your work.
* Late submission will result in ZERO marks being awarded.
* Identical copy from students or other resources will result in ZERO marks for all involved students.

Student Details:

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| **Name:** ###**CRN:** ### |  | **ID:** ### |
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# Question One

***2 Marks***

*Learning Outcome(s):*

To understand the concept of the normalization process (1NF, 2NF, 3NF, and BCNF).

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A. Consider the following relation R with all functional dependences F and normalize it into 2NF, 3NF, and BCNF.

R= {Patient\_No,Patient\_Name,App\_No,Time,Doctor}

F= { Patient\_No 🡪 Patient\_Name

Patient\_No, App\_No 🡪 Time, Doctor

Time 🡪 App\_No }

B. Explain why the following relation R is in 3NF but not in BCNF.

 R={**a,b**,c,d}

F= {a,b 🡪 c,d

 a,d 🡪 b}

# Question Two

***2 Marks***

*Learning Outcome(s): To understand relation algebra expressions, To write relational algebra, and to analyze it*

author(author\_id, first\_name, last\_name)

author\_pub(author\_id, pub\_id, author\_position)

book(book\_id, book\_title, month, year, editor)

pub(pub\_id, title, book\_id)

* author\_id in author\_pub is a foreign key referencing author.
* pub\_id in author\_pub is a foreign key referencing pub
* book\_id in pub is a foreign key referencing book
* editor in book is a foreign key referencing author(author\_id)
* Primary keys are underlined



1. How many tuples will be returned by the following relational algebra query?

Π book\_title(book)

1. What question does the following expression answer?

Π author\_id (author) – Π editor(book)

1. Write a relational algebra expression that returns the names of all authors who are book editors.
2. How many tuples are returned by the following relational algebra expression?

 author ⨝ author\_id=editor book