EASTERN UNIVERSITY, SRI LANKA
SECOND EXAMINATION IN SCIENCE –2010/2011
SECOND SEMESTER (Apr. /May, 2017)
EXTCS 203 – DATABASE DESIGN
(SPECIAL REPEAT)

Answer all Questions   **Time: 2 Hours**

Q1)

i) Explain the terms *Data* and *Information* with a suitable example.

ii) Define the term *Database Management System* (DBMS).

iii) Briefly describe three advantages of using a Database Management System comparing to the usual approaches of an office.

iv) Briefly describe *Data Definition Language* (DDL) and *Data Manipulation Language* (DML) with example.

v) Describe *Primary key* and *Foreign key* with a suitable example.

Q2)

i) What is *Entity Relationship* (ER) Modal?

ii) Define each of the following terms:

    a. Entity;

    b. Simple attribute;

    c. Composite attribute;

    d. Multi-valued attribute;

    e. Relationships.

iii) Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):

- o the NHL has many teams,

- o each team has a name, a city, a coach, a captain, and a set of players,

- o each player belongs to only one team,

- o each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,

- o a team captain is also a player,

- o a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2).

Construct a clean and concise ER diagram for the NHL database.

Q3)

i)   Define the term *Normalization*.

ii)   Define the following normal forms with examples:

    a. First normal form;

    b. Second normal form;

    c. Third normal form;

    d. Boyce Codd normal form.

iii) The following table shows a snapshot of data of a Construction Company. Describe th

process of normalizing the below table into tables of third normal form.

TABLE: STUDENTS

Name	Age	Pet	Pet Name
Heather	10	Dog	Rex
		Cat	Thomas
Rachel	10	Cat	Fluff
Jimmy	11	Dog	Kimba
Lola	10	Cat	Thomas

Q4)

i) Consider the relation schemas as follows:

works(person_name, company_name, salary);

lives(person_name, street, city);

located_in(company_name, city);

managers(person_name, manager_name);

The key fields are underlined. The manager_name refers to person_name. Write the following queries using SQL.

    a. To find the names of all employees who works for 'EUSL'.

    b. To find the names and cities of residence of all employees who work for 'EUSL'.

    c. To find the names, street address, and cities of residence of all employees who work for 'EUSL' and earn more than $10 000 per annum.

    d. To find the names of all employees who live in the same city and on the same street as do their managers.

    e. To find the names of all employees who do not work for 'EUSL'.

    f. To find the names of all employees who earn more than every employee of 'OUSL'.

ii) Define **Relational Algebra** in your own words.

iii) Briefly describe the following term.

    a. Select;

    b. Project;

    c. Cartesian product;

    d. Union.