S265C/101C, S8265/101C, S8266/101C

DUBLIN INSTITUTE OF TECHNOLOGY

DT265C Fundamentals of Computing Diploma (CPD)
DT8265 Higher Diploma in Computing
DT8266 Fundamentals of Computing Diploma (CPD)

SUMMER EXAMINATIONS 2014/2015

INFORMATION SYSTEMS [CMPU4061]

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MONDAY 25TH MAY 9.30 A.M. – 11.30 A.M.

TWO HOURS

ANSWER ***TWO*** QUESTIONS.

ALL QUESTIONS CARRY EQUAL MARKS.

1. (a) Consider a MOVIE database in which data is recorded about the movie industry. The data requirements are summarized as follow:

Each movie is identified by title and year of release. Each movie has a length in minutes. Each has a production company, and each is classified under one or more genres (such as horror, action, drama, and so forth). Each movie has one or more directors and one or more actors appear in it. Each movie also has a plot outline. Finally, each movie has zero or more quotable quotes, each of which is spoken by a particular actor appearing in the movie.

Actors are identified by name and date of birth and appear in one or more movies. Each actor has a role in the movie.

Directors are also identified by name and date of birth and direct one or more movies. It is impossible for a director to act in a movie.

Production companies are identified by name and each has an address. A production company produces one or more movies.

Using the details given in the above statement:

Create an Entity – Relationship (ER) diagram (Diamond notation) to represent the Movie data requirements described above. State any assumptions you made when creating the ER diagram. Be sure to include attributes as part of your ER design.

(20 Marks)

Convert your Diamond notation diagram into a Crows feet notation diagram.

(20 Marks)

Write SQL statements to create the tables for each entity

(10 Marks)

2.

(a) *Data*, *Information* and *Knowledge* are frequently used terms in relation to databases. Define each term and identify the relationships of these three terms. Provide two examples to each of the terms.

How do databases add "semantic richness" to data?

(20 Marks)

(b) Discuss the strengths and limitations of the *relational data model*

(20 Marks)

(c) One of the most important functions of a database is to ensure and preserve *Data Integrity*. Consider any two general database topics discussed in class which you feel have relevance to integrity preservation and illustrate how they achieve that goal.

(10 Marks)

3. (a) A school has primary pupils, secondary pupils and teachers. Each teacher has a permanent classroom with unique number. Each primary pupil is taught by a single teacher, where each secondary pupil is taught by number of teachers. A unique exam code is allocated to each secondary pupil.

I. List the set of relations based on the description.

(10 marks)

II. Write a query in SQL to find the exam code of secondary pupil John Smith who is taught by David Copperfield.

(5 marks)

III. Write a query in SQL to find names of Primary teacher whose classroom number is greater than 200.

(5 marks)

IV. Write the query in SQL to find all details of primary pupils who have lessons in classroom 103 and age over ten.

(5 marks)

(b) List the classes of database users, and give a simple explanation of their roles.

(10 Marks)

(c) Describe in detail the three phases involved in the development of the "Lifecycle of an Information System". Illustrate your answer with appropriate diagrams.

(15 Marks)