UNIVERSITY OF LONDON
GOLDSMITHS COLLEGE

Department of Computing

B. Sc. Examination 2013

IS52027A
Databases, Networks and the Web

Duration: 3 hours

Date and time:

This paper is in two parts, Part A and Part B. There are a total of three questions in each part. ***You should answer TWO questions from Part A and TWO questions from Part B.*** *Your answers to Part A and Part B should be written in separate answer books.*

Full marks will be awarded for complete answers to a total of four questions, two from Part A and two from Part B. Each question carries 25 marks. The marks for each part of a question are indicated at the end of the part in [.] brackets.

There are 100 marks available on this paper.

No calculators should be used.

THIS PAPER MUST NOT BE REMOVED FROM THE EXAMINATION ROOM

PART A

Question 1

The following database formed of the tables **Film, Store** and **Sells**, provides information about films on DVD that are sold in different stores. The names of the first two tables and of their attributes are self-explanatory. It is known that the address of a store finishes by the city name. A row in the table **Sells** shows which film is sold in which store at which price, and the number of DVD copies of the film currently available in the store (see *number_copies* attribute).

Film(filmid, title, genre, year, director, producer, popularity)
Store(storeid, name, address, telephone, website)
Sells(filmid, storied, price, number_copies)

You are required to write the following queries in SQL.

a) Display the average price of films. **[2]**

b) How many stores are there in the database? **[2]**

c) Display the titles of movies directed by Steven Spielberg between 1990 and 2000. **[3]**

d) How many stores are there in Manchester? **[3]**

e) What is the average price per film? Display the filmid, the film title, and the average price. **[3]**

f) What is the title of the film with the highest popularity? **[3]**

g) In which year has the largest number of musical films (that is, Genre='musical') been made (according to the database records)? **[4]**

h) Display the price and the store name and its address where the film War Horse is available at the minimum price. **[5]**

Question 2

The following database formed of three tables **Staff, Branch** and **Works**, stores information about staff members working in various branches of a company. The names of the tables and of the attributes are self explanatory. In particular the table **Works** shows which staff member works in which branch, and the date when he or she started to work there. Moreover, each value of the attribute *managerno* in the table **Branch** is a value of the *staffno* attribute in table **Staff** and indicates the staff member that manages the respective branch. The primary keys in each table are underlined.

Staff (staffno: integer, name: varchar(30), age: integer, salary: integer)
Branch (branchno: integer, branchname: varchar(20), address: varchar(40), managerno: integer)
Works (staffno: integer, branchno: integer, startdate: date)

You are required to:

a) Identify all the foreign keys in the database, indicating for each of them, the parent and child tables. **[3]**

b) Create in SQL the table Staff including an integrity constraint that guarantees that every staff member is more than 18 years old. **[4]**

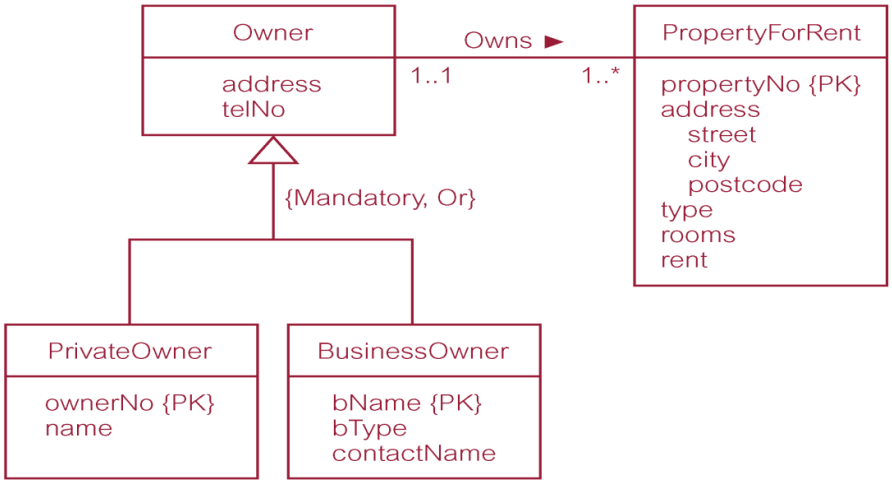
c) Create in SQL the table Branch including an integrity constraint according to which each manager has a salary between £40,000 and £70,000. **[6]**

d) Create in SQL the table Works including an integrity constraint according to which no manager can be a staff member of another branch but the branch he or she manages. **[6]**

e) Create in SQL a view called Recent_staff_2010 that provides the name, age and salary of staff members that started to work in their current branch in 2010 or thereafter. Then state if the view is updateable and briefly justify your answer (use no more than two statements). **[6]**

Question 3

a) Explain the meaning of the words *Mandatory* and *Or* in the context of the EER diagram below. Do not use more than two statements. **[2]**



b) Given the following specification, you are required to draw an ER diagram, in which you should include the relevant entity types with their primary keys, and the relationship types with their constraints. **[23]**

A company specialized in car repairs has a number of garages. Each garage, identified by a garage code, has one manager that coordinates the work of at most 15 staff members working in the garage. Each member of staff is indentified by a staff number. Each client, possessing one or more cars, can register with any of the garages of the company, receiving unique identification numbers as clientNo for the client, and carNo for each car brought for repairs. These identification numbers can be used in all the garages in the company, so no client nor car are registered twice in the company's garages. Once a car is brought to a garage, the garage's staff perform a battery of at most 20 tests, each test being performed by only one member of staff per car. Each test is identified by a unique number testNo. Tests may lead to the recommendation of several repairs. The company has a number of standard types of repairs that can be prescribed, each being identified by a code repairTypeCode.