### CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS ATLANTIC PROVINCES BOARD OF EXAMINERS FOR LAND SURVEYORS

# **SCHEDULE I / ITEM 5** DATA BASE MANAGEMENT SYSTEMS (INFORMATICS)

#### **March 2007**

## **Examination Results for Candidate No.:**

#### Note: This examination consists of 8 questions on 2 pages. Time: 3 hours Q. No Value Earned For the following relational database structure, give 5 constraints you should implement to improve data integrity: \_ 🗆 🗙 🧰 City : Table Latitude Longitude No Name Pop\_1996 Pop\_2001 Pop\_2007 Province 1 Abbotsford 105043 129475 164083 British Columbia 49.06 -122.30 79191 129963 215587 Ontario 44.38 -79.68 2 Barrie 2 Brantford 84764 3215748 88122 Ontario 43.15 -80.26 768082 879277 1013675 Alberta 51.05 -114.06 4 Calgary 5 Saguenay 108409 110942 Quebec 48.43 -71.08 6 Edmonton 193.57 -113.54 782101 841202 alberta 7 Guelph 95821a 106920 120101 Ontario 43.56 -80.26 ۲ 8 Halifax 276221 261215 Nova Scotia 44.67 -63.61 \* 1 10 Record: 14 4 8 ▶ ▶I ▶\* of 8 Bank : Tabl 🔢 BankInCity - 🗆 × - U × Bank\_ID Name Bank\_id City\_id Bank\_name Alberta 5 8 1 Bank of Montreal 5 2 Canada Trust Quebec 1 British Columbia 3 National Bank of Canada 4 1 Ontario 4 4 Royal Bank of Canada 4 ▶ 5 Nova Scotia 18 7 Scotiabank \* \* \* Record: II I 5 Record: IN A 5 ▶ ▶I ▶\* of Record: II I For the previous relational database structure, do the reverse engineering process and draw the conceptual schema that might represent the semantics of this database. Each city is represented by a point, each country by an 2 20 aggregated of polygons and banks have no geometry. You can draw a UML object-class diagram or an Entity/Relationship diagram. Write the appropriate SQL query to answer the given questions: a) how many banks are there in Calgary? b) what is the difference between Abbotsford population in 1996 and 2007? 3 15 c) in which province Saguenay city is in? d) in 2007, which cities have a larger population than Halifax? e) How many banks are in Ontario? What are the steps required to develop a spatial database that corresponds 4 15 to users' needs? Give an example of a table which does not respect the first normal form ("A relation in which the intersection of each row and column contains one 5 10 and only one value"). Give a solution for this example, to respect the first normal form.

#### Marks

6	Give two characteristics of the data held in the data warehouse.	5	
7	What is ISAM ? Give one problem with this method.	5	
8	Define each of the following: a) Database b) Database Management System c) Relational Table d) UML e) Data Manipulation Language (DML) f) Primary key g) Foreign key	20	
	Total Marks:	100	