CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

SCHEDULE I / ITEM 5   March 2010
DATABASE MANAGEMENT

Note: The use of calculators or similar devices is not permitted in this exam.

Note: This examination consists of 10 questions on 2 pages.   **Marks**

Q. No	Time: 3 hours	Value	Earned
1.	What is database normalization? Name and explain one of the normal forms.	10	
2.	Translate this conceptual schema designed with UML, into a Relational Database Schema:	20	
3.	a) Give an example of Trigger use in a spatial database.	2.5	
	b) Before or after which SQL operations, are actions triggered?	4.5	
4.	a) What should a PRIMARY KEY be used for?	3	
	b) What should a FOREIGN KEY be used for?	3	
	c) Can a PRIMARY KEY be declared on multiple columns? Explain.	3	
5.	For the relational database schema you have done in #2, give three examples of database integrity constraints and two examples of spatial data integrity constraints you should implement. (2 pts each)	10	
6.	How do most GIS join their geometric features with the content of a Relational Database?	5	
7.	a) What is indexing?	3	
	b) Why do we use it?	3	
	c) Give the name of a relational database component that must be indexed.	3	
8.	In a relation table, give a synonym of:		
	a) a row	2	
	b) a column	2	
	c) a cell	2	

9.	With the database implementation done in #2, is it possible to answer the following questions? If no, explain why. If yes, write the appropriate SQL query. (3 marks each) a) What is the population of Alberta? b) How many commercial-use buildings are in Prince Edward Island? c) What are the names of villages included in Saskatchewan? d) How many buildings have both residential use and commercial use? e) Give the list of buildings having more than one address	15	
10.	Define: a) Spatial Database b) Spatial Data Warehouse c) Spatial Datamart Explain how they differ.	2 2 2 3	
	Total Marks:	100	