## CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

## SCHEDULE I / ITEM 5 DATABASE MANAGEMENT

October 2009

## Note: This examination consists of 9 questions on 2 pages.

<u>Marks</u>

	Time 2 hours				
<u>Q. No</u>	<u>Time: 3 hours</u>				
1.	Name and then explain three tasks done in the Design phase of a Geospatial Database.				
2.	<ul> <li>A municipality asks you to build a simple geospatial database to store cadastral and ownership information. The geospatial database must include: <ul> <li><u>Municipality</u>: name, population, validity date of population, polygon geometry</li> <li><u>Building</u>: building number, civic number, street name, number of floors, value, polygon geometry</li> <li><u>Parcel</u>: number, area, polygon geometry.</li> <li><u>Right</u>: type of right (property, possession,)</li> <li><u>Person/Rightful claimant</u>: name, address</li> </ul> </li> <li>Relationships: <ul> <li>Building belongs to "Person/Rightful claimant" according to a given right. Ex. Building 24 belongs to John Smith, who is the owner (property right).</li> <li>Land belongs to "Person/Rightful claimant". Ex. Parcel 125 is a land object belonging to Jane Myers, who is the owner (property right).</li> <li>A building is included in a Parcel. Ex. The Parcel 125 includes the building 24.</li> <li>A Municipality includes Parcel and Building.</li> </ul> </li> <li>Describe this demand with a conceptual database schema (CIM level) (you can use UML or Entity- Relationship modeling formalisms).</li> </ul>				
3.	<ul> <li>With the data model that you have created in #2, can you answer the following questions (using one or many queries) with a GIS? If the data model is implemented in a geospatial database? (yes/no) Explain how you can answer these questions or why you can not.</li> <li>1. How many parcels are inside Albany municipality?</li> <li>2. Select the building where John Smith lives?</li> <li>3. What is the number of parcels touching the boundary of parcel number 125?</li> <li>4. How many buildings are owned by a different owner of the parcel?</li> </ul>	8			
4.	Name and explain three steps needed to translate a conceptual model to a logical model for a relational database.	9			

ROAD ID       ROAD CLASS       ROUTE NUMBER       NUMBER OF LANES       PAVAMENT STATUS       STRUCTID         4957       Collector       25       3       Paved       5059       15         5059       Collector       25       2       Paved       256       15         5161       COLLECTOR       25       2       Paved       256       15         5435       Collector       118       2       Paved       234       15         5911       Collector       112       2       Paved       234       6016       Collector       12       2       Paved       2341       15         STRUCTUD       STRUCTURE       STRUCTURE NAME       BUILDING DATE       AGE       2341       15         234       Bridge       Basin Head Bridge       21/07/1990       19       10       15         234       Bridge       Midgell Bridge       14/06/1979       30       15       15         3       What is the oute number 5 (supposing that the data has been corrected), write the appropriate SQL queries to answer these questions:       15       15         3.       What is the route number of the segment passing over the Basin Head Bridge?       15       15         3.		Identify 5 errors in the following data that would have been avoided had the integrity constraints been created. For each error, name the integrity constraint and explain how the error could have been avoided.							
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