ASSOCIATION OF CANADA LANDS SURVEYORS - BOARD OF EXAMINERS
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SCHEDULE I / ITEM 5 — March 2004

DATA BASE MANAGEMENT SYSTEMS (INFORMATICS)

Note: This examination consists of 8 questions on 1 page.

Time: 3 hours

Q. No		Marks Value	Marks Earned
1	What are the similarities and differences between "Relational database", "Object-relational database" and "universal server"?	9	
2	How does the relational model handle one-to-many and many-to-many relationships between tables, (e.g. between a table “house” and a table “person”)? How does it handle recursive relationships?	15	
3	What are integrity constraints? What are spatial integrity constraints? Give 3 examples of spatial and non-spatial integrity constraints.	16	
4	A client in forestry asks you to build a simple geospatial database that deals with forests (name, total area, perimeter, % of unexploitable land, average area of included forest stands, mapped as polygon), individual forest stands (number, area, perimeter, exploitable::yes/no, trees dominant specy, mapped as a polygon), Buildings (camp name, building number, use, mapped as a point), Building owners (name, address of residence, category::private/public), ownership of the forests and exploitation rights (ownership and exploitation rights may be different for a same forest). How would you implement the database described above with an RDBMS and a GIS of your choice (what would be the tables and columns required, how would you create the link with the map)? N.B. A Forest may have no Building on it. One owner may own several buildings, but there is no co-ownership. Ownership is unique for a forest, but there may be several rights allowing the exploitation of the same forest, for example for different areas or different purposes).	23	
5	For the database in Question 4, write SQL commands for the following queries: a) Find all owners of private buildings in Forest A. b) Find all rights allowed for Forest A. c) Find the dominant specie of the forest stand where building #14 is located.	12	
6	What is a system lifecycle? What are the steps required to develop a spatial database?	10	
7	What is UML? How can it help to develop spatial databases?	8	
8	What are metadata? What are they useful for? Give 3 examples of metadata.	7	
	Total Marks:	100	