CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

E1 – SPATIAL DATABASES & LAND INFORMATION SYSTEMS

October 2011

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

Time: 3 hours

Marks

Q. No		Value	Earned
1.	You are mandated to design and develop a spatial database system. After discussing with the client, you think that an agile method will be more appropriate than a disciplined method to develop the database system. Give three reasons why you should use an agile method instead of a disciplined method. (3 pts each)	9	
2.	Name two organizations which have developed standards for geospatial data (1.5 pt each). Give three topics covered by these standards (2 pts each).	9	
3.	You are mandated to design a spatial database in order to manage a road network. Give three examples of criterion that can be used to segment the road. (3 pts each)	9	
4.	Name and describe the three levels usually used in data modeling. Explain the differences between each of them. (3 pts each)	9	
5.	What are WMS and WSF? (3 pts each)	6	
6.	Give two characteristics of the data held in the data warehouse. (3 pts each)	6	
7.	The table below does not respect the three normal forms used to reduce database redundancy and inconsistencies. **Parcel** 	Parcel_ID	Area	HouseNb	Streetname	City	Owner	Sexe	Phone_number	 	104928	900	34	Oark	Ottawa	Jack Brown	M		 	323482	542.5	568	Malton	Ottawa	Anna Williams; Richard Taylor	F; M	613-648-5555	 	326548	1364.56	23	Main	Ottawa	John Smith	M	613-456-2344; 613-726-2344	 a) Name (1 pt) and define these three normal forms (2 pts each) (7 pts) b) Identity in the above table where these three normal forms are not respected (one example for each normal form) and explain why (2pts each = 6pts) c) Using this same table, do reverse engineering and draw a conceptual model or a logical model that respects the normal forms. (10 pts). Specify whether your model is conceptual or logical. (1 pt) d) In your model, add appropriate geometries for spatial entities (3 pts)	27	
8.	Using the structure of the Parcel table of #7, write an SQL query which can a) select the parcel ID owned by Richard Taylor. (3 pts) b) select the parcels where the area is greater than 500m². (3 pts)	6	
9.	You would like to join these two tables to obtain all the records of table 1 and linked records of table 2. Which type of "JOIN" operator would you use and why? Table 1 — ID, Field1, Field2 Is linked to 0,N → ← Is linked to 1,1 Table 2 — ID, Field1, Table1ID	5	

10.	For each of the following definitions, give an appropriate answer: a) Part of SQL which allows a user to modify the contents of a database by inserting new data, removing old data and changing the values of existing data. b) Used to uniquely identify each record in a table. c) A small, single-subject area spatial data warehouse subset that provides decision support to information users from a specific department or business function of an organization. d) Used to store limited permissible values of a field. e) In terms of databases, this refers to the transparent exchange and integration of data drawn from different databases independent of format or origin. f) Used to avoid orphan records in a "child table" linked to a "parent table". g) Software package with computer programs that control the creation, maintenance, and the use of a database.	14	
	Total Marks:		100	