

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

**E1 - SPATIAL DATABASES
& LAND INFORMATION SYSTEMS**

March 2012

Note: This examination consists of 11 questions on 2 pages.

Marks

Q. No

Time: 3 hours

Value Earned

1.	Give three particularities of a LIS.	9															
2.	What can CASE tools do to support modeling? Give three benefits.	9															
3.	<p>OWNER</p> <table border="1"> <tr> <td><u>OWNER_PK</u></td> <td>NAME</td> <td>ADDRESS</td> </tr> </table> <p>PARCEL</p> <table border="1"> <tr> <td><u>PARCEL_PK</u></td> <td>AREA</td> <td>ASS_VAL</td> <td>ZONING</td> </tr> </table> <p>OWN</p> <table border="1"> <tr> <td><u>PARCEL_PFK</u></td> <td><u>OWNER_PFK</u></td> </tr> </table> <p>PARCEL_REGISTER</p> <table border="1"> <tr> <td><u>REG_NUM_PK</u></td> <td>DATE</td> <td>INSTRUMENT_TYPE</td> <td>AMOUNT</td> <td><u>PARCEL_FK</u></td> </tr> </table> <p>Note: PK = Primary key, FK= Foreign Key and PFK = Primary and foreign key REG_NUM_PK = Registration numbers of documents registered on the property in Parcel register. INSTRUMENT_TYPE is for example, transfer, charge, discharge.</p> <p>With this data structure, is it possible to have more than one document registered on a parcel? Explain.</p> <p>Do reverse engineering to draw the conceptual model (CIM level) of this implementation. Add the appropriate geometry for spatial entity.</p>	<u>OWNER_PK</u>	NAME	ADDRESS	<u>PARCEL_PK</u>	AREA	ASS_VAL	ZONING	<u>PARCEL_PFK</u>	<u>OWNER_PFK</u>	<u>REG_NUM_PK</u>	DATE	INSTRUMENT_TYPE	AMOUNT	<u>PARCEL_FK</u>	3	12
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4.	What is a Generalization in UML modeling or E/R modeling? Draw an example model using generalization in a LIS context.	3	5														
5.	Give three of the four levels of granularity used to implement metadata in spatial databases.	6															
6.	Give two examples of <i>pseudo-spatial data</i> (spatial data that are not referenced with coordinates).	4															
7.	Give three benefits of storing spatial entities in a spatial database instead of shapefile or CAD.	9															
8.	Give three topological rules that should be interesting to implement to avoid inconsistent data for Parcel entity.	9															

9.	<p>With relational DBMS, explain how to implement:</p> <p>a) one to one relationships (1:1)</p> <p>b) one to many relationships (1:N)</p> <p>c) many to many relationships (N:N)</p> <p>d) recursive relationships</p>	12	
10.	<p>Using the tables in Question #3, write the appropriate SQL queries to answer the following questions:</p> <p>a) What is the assessment value of the parcel(s) owned by John Smith?</p> <p>b) How many documents are registered on parcels located in zone 1?</p> <p>c) What is the highest amount registered for parcel number 2362184?</p>	9	
11.	<p>Define each of the following terms:</p> <p>a) Web feature service</p> <p>b) Data Warehouse</p> <p>c) Data Mining</p> <p>d) Geospatial database</p> <p>e) Structured Query Language</p>	10	
Total Marks:		100	