

**CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS
ATLANTIC PROVINCES BOARD OF EXAMINERS FOR LAND SURVEYORS**

SCHEDULE I / ITEM 6

October 2007

MAP PROJECTIONS AND CARTOGRAPHY

Note: This examination consists of 8 questions on 2 pages.

Marks

<u>Q. No</u>	<u>Time: 3 hours</u>	<u>Value</u>	<u>Earned</u>
1	<p>a) If the scale along a standard line of a map is 1:250,000 and the scale factor at another point P on the map is 0.9940, what is precisely the scale at point P?</p> <p>b) Explain, with regard to digital mapping, why the graphic form of scale representation is often preferred to the numeric form.</p> <p>c) You have measured a slope distance of 1987.62 m from a monument with UTM coordinates, to a point B. The astronomic azimuth of the line to B is found by observation of the Sun. The orthometric heights of the observation point and of B are both known, as are the geodetic latitude and longitude of the observation point. Answer the following questions as completely as possible, listing all other information you may need in each case.</p> <p>i) Describe how you would manually reduce the astronomic azimuth to a grid azimuth.</p> <p>ii) Describe how you would manually reduce the measured distance to a grid distance.</p> <p>d) If a 3TM zone (having no false eastings and no false northings) and a UTM zone have the same central meridian, what is the UTM easting of a point with a 3TM easting of 113,660.42 m (assuming the 3TM scale factor of the central meridian is 0.99990)?</p>	3 2 10 5	
2	<p>a) What is an orthophoto base map (defining at least orthophoto and base map)?</p> <p>b) How is it related to a planimetric base map?</p> <p>c) Discuss the suitability of an orthophoto base for a large scale cadastral mapping series. What advantages do digital orthophotos have over hardcopy orthophotos?</p>	20	
3	Discuss the advantages and disadvantages of offset multicolour printing techniques with modern digital multicolour printing techniques. Pay particular attention to cost, quality and ease of use.	5	
4	What are the visual variables used for thematic mapping? Which of these variables will be rated poor for a black-and-white choropleth mapping? Why?	6	

5	<p>What basic elements must be found on virtually all maps in order to achieve a level of representation that is useful to the end user? Indicate four of these elements that are sensitive to context. In addition to those basic elements listed above, what other information should be contained on a map that is to become a part of a public record of land division?</p>	12	
6	<p>a) Different countries use different map projections. How does this fact relate to the position and shape of countries?</p> <p>b) Explain clearly the term “conformality” with respect to the exactness of angle measurement, direction measurement and point scale.</p> <p>c) Give one advantage and one disadvantage of the Mercator projection.</p> <p>d) What are the Transverse Mercator and the UTM projections used by the Federal Government in Canada?</p>	8 3 3 3	
7	<p>Discuss “UTM” and “Street Address” systems of georeferencing with regard to their characteristics, spatial precision, and shortcomings. Provide 3 GIS examples requiring a conversion between these two georeferencing systems.</p>	10	
8	<p>Explain the following as completely as possible:</p> <p>a) How cartography as a form of visual communication is different from other forms of visual communication.</p> <p>b) What are two of the most important decisions that cartographers usually make in the process of cartographic design.</p> <p>c) How would you determine if a map is a good one?</p> <p>d) How would you recognize and resolve the need for cartographic generalization?</p>	2 2 2 4	
Total Marks:		100	