CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS
ATLANTIC PROVINCES BOARD OF EXAMINERS FOR LAND SURVEYORS
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SCHEDULE II / ITEM 1   **October 2006**

GEODETIC POSITIONING

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Note: This examination consists of 4 questions on 1 page   **Marks**

Q. No	Time: 3 hours	Value	Earned
1	a) What is a horizontal datum? b) What is the ITRS? What are ITRFs? How do they relate? c) How is the Canadian Spatial Reference System defined and realized? d) Is there any difference between relative positioning and differential positioning? Explain. e) What is the advantage of geodetic networks over single baselines?	25	
2	a) What is a vertical datum? b) What is the difference between orthometric height and geodetic height? c) In practice, what would you do to transform from one to another? d) Define sea surface height. e) Natural Resources Canada intends to adopt a geoidal model as the vertical frame in the future. What consequences, if any, would this decision bring to those who only need to use total stations for their professional practice?	25	

3	a) What are the characteristics, applications and attainable accuracy of:
	   - Dual-frequency Real-Time Kinematic (RTK)?
	   - Single-frequency Differential GPS (DGPS)?
	b) What is the difference between a passive and an active positioning system?
	c) Consider a range satellite system in which all satellites transmit the same frequency. How can a receiver distinguish among the different signals to know which one is transmitted by a particular satellite?
	d) What are the effects that troposphere and ionosphere have on electomagnetic signals? How can these effects be accounted for?
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4	a) One bench mark has orthometric height equal to 50.377 m. This benchmark serve as reference for a baseline determined with GPS. Geodetic heights determined from this bench mark to the point of interest are equal to 40.590 m and 47.211 m, respectively. The geoidal height difference between the bench mark and the point of interest is 0.056. What is the orthometric height of the point of interest? b) A point of latitude equal to 45° is 2° in longitude away from a reference longitude. What is the approximate value of the meridian convergence at this point?	12.5 12.5	
	Total Marks:	100	