

**ASSOCIATION OF CANADA LANDS SURVEYORS - BOARD OF EXAMINERS  
WESTERN CANADIAN BOARD OF EXAMINERS FOR LAND SURVEYORS  
ATLANTIC PROVINCES BOARD OF EXAMINERS FOR LAND SURVEYORS**

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**SCHEDULE II / ITEM 1  
GEODETIC POSITIONING**

**March 2003**

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

**Marks**

**Q.No**

**Time: 3 hours**

**Value   Earned**

<u>Q.No</u>		<u>Value</u>	<u>Earned</u>
1	What is the difference between a map projection and a datum?	5	
2	(a) Define orthometric height. (b) Why is it necessary to know gravity in order to derive CGVD28 orthometric heights from leveling observations? (c) How can orthometric height be computed from ellipsoidal height?	15	
3	(a) Define geodetic azimuth. (b) Define astronomic azimuth. (c) Define grid azimuth (eg. derived from UTM coordinates). (d) What information is necessary to convert geodetic azimuths to astronomic azimuths? (e) What is the main information required to convert a geodetic azimuth to a grid azimuth?	15	
4	(a) Describe the basic principle of measurement used by EDMs and GPS (using the carrier phase). How is the basic principle implemented differently in long range microwave EDMs, electro-optical EDMs and GPS? (b) How does rain affect microwave EDMs, electro-optical EDMs and GPS?	15	
5	Describe the definition and realization of the NAD27 datum and NAD83 datum.	10	
6	A precise survey, using GPS, is required on Canada Lands. The results must be provided in NAD83(CSRS). What are the steps necessary to obtain the coordinates in NAD83(CSRS)?	10	
7	(a) Define inertial reference system and terrestrial reference system. Give an example of each reference system and when it is used. (b) How are these two reference systems related to each other?	15	
8	For precise static positioning using GPS, briefly describe the main sources of error and how are they accounted for.	15	
<b>Total Marks:</b>		100	0