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

SCHEDULE II / ITEM 1 — March 2007

GEODETIC POSITIONING

Note: This examination consists of 10 questions on 1 page — **Marks**

Q. No — Time: 3 hours — Value — Earned

Q. No		Value	Earned
1	One can use any surface as a vertical datum. There are several surfaces that can be used as datums in geodesy. a) What are the vertical datums, that you are aware of, that are used in geodesy? b) How do they relate and how do they differ?	10	
2	Consider that the (geocentric) origin of 2 geodetic frames, A and B, relate to each other by 3 translation, from A to B, parameters given by 5 m, 10 m and 1 m, in X, Y and Z components, respectively. The cartesian coordinates of a point in frame A are 3,000,000 ; 500,000 ; 5,500,000. What are the coordinates of the same point in frame B?	10	
3	The output of a GPS processing package provides a list of ECEF baseline components: ΔX, ΔY, ΔZ. Your boss wants you to write a report saying that these baseline components correspond to $\Delta\phi$, $\Delta\lambda$ and Δh, respectively, where ϕ, λ and h represent geodetic latitude, longitude and height. Would you agree or disagree with him? Why?	10	
4	You are given the tropospheric delay value for two satellites: PRN05 = 4 m; PRN15 = 10 m. (a) What satellite is higher in the sky? Why? (b) What signal did arrive at the receiver first? (c) By how many seconds?	10	
5	What are the differences between geodetic, astronomic and grid (e.g,. derived from UTM coordinates) azimuths?	10	
6	A DGPS survey is to be made in an area ranging from 50 to 100 km from the reference station. Discuss the equipment necessary, observables, observation time, data processing and other parameters or procedures required to obtain 3D position at 50 cm, 1-sigma.	10	
7	What are the differences/advantages in the use of L1 or L1/L2 GPS receivers?	10	
8	What is the difference between NAD83(adopted) and NAD83(CSRS)?	10	
9	What field procedure can be used to avoid multipath?	10	
10	What do you understand by “Four-dimensional” geodesy? Give examples.	10	
	Total Marks:	**100**	