CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

C12 - HYDROGRAPHIC SURVEYING   **March 2014**

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

Q. No	Time: 3 hours	Value	Earned
1	Please define the following in one or two sentences a) Uncertainty b) Neap Tide c) Seiche d) Daily Inequality (with repect to tides) e) Diurnal Tide f) Lead Line g) Bar Sweep h) Patch Test (in the context of multibeam surveying) i) CTD j) Bandwidth	2 2 2 2 2 2 2 2 2 2	
2	Describe the principles of long, short and ultra-short baseline acoustic positioning system modes.	9	
3	Describe the factors that contribute to the total vertical uncertainty of a sounding derived from a multi-beam survey.	10	
4	Why is the tidal range in the Bay of Fundy much larger than in the mid-Atlantic?	6	
5	Describe the difference between physical beam forming and electronic beam forming.	5	
6	With the use of diagrams, describe the four main errors that a multibeam "patch test" is designed to address. Make sure you include where, how and why the patch test lines are run.	10	
7	Describe a hydrographic survey scenario where LiDAR would be more advanageous than mulitbeam, and explain why.	10	
8	Name the three properties of sea water that affect the speed of sound through the ocean. What are their units and typical ranges? What is the typical range of sound velocity in ocean water?	10	
9	How can SSS imagery be used to estimate the height of an object on the sea bed? What assumption must be made in order for this method to work properly?	10	
10	Why is it necessary to apply motion corrections (pitch and roll) to narrow angle, single beam observations and not to wide angle, single beam observations? Use a diagram to illustrate your answer.	10	
		100	