CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

	C12 - HYDROGRAPHIC SURVEYING	October 2016	
	Note: This examination consists of 12 questions on 1 page.	**Marks**	
Q. No	Time: 3 hours	Value	Earned
1.	Please define the following in one or two sentences:		
	a: Diurnal Tide	2	
	b: S-44	2	
	c: Seiche	2	
	d: Bar Sweep	2	
	e: CTD	2	
	f: Band Width	2	
	g: LiDAR	2	
	h: Cross-check Line	2	
	i: Patch Test	2	
	j: LAT	2	
2.	With the help of a diagram, describe Snell's law and explain how it is used in acoustic ray tracing.	10	
3.	What is a Bar Check and what is it used for?	7	
4.	Describe three of the main sources of vertical uncertainty involved in single-beam depth reduction.	3	
5.	In terms of acoustic transducer design, what are the trade-offs between the acoustic pulse duration and system resolution?	6	
6.	How is the beam width of a single beam transducer defined, in terms of intensity loss in dB? What is it in percent?	4	
7.	With the aid of diagrams/sketches describe thoroughly the tidal effects caused by the Sun-Moon-Earth interaction.	7	
8.	Why is the tidal range in the Bay of Fundy much larger than in the mid-Atlantic?	3	
9.	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	
10.	With the help of diagrams, describe what side scan sonar (SSS) is, how it works and what it is used for.	10	
11.	Describe the basic survey "orders" as defined in the "S-44 IHO, 5th Edition, Standards for Hydrographic Surveying". Include: a) horizontal and vertical uncertainties for soundings b) minimum object detection size c) bottom coverage	10	
12.	Compare and contrast the use of multi-beam versus airborn bathymetric LIDAR in hydrography. Include descriptions of when, where and why LiDAR is more suitable than the multi-beam and vice versa.	10	
		100	