

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

C12 - HYDROGRAPHIC SURVEYING		March 2025	
Note: This examination consists of 15 questions on 1 page.		Marks	
Q. No	Time: 3 hours	Value	Earned
1	Write the equation that relates frequency, wavelength and sound velocity.	5	
2	How is sound velocity determined from a CTD measurement?	5	
3	What is the difference between a Linear Frequency Modulated (LFM) pulse (CHIRP) and a continuous wave (CW) pulse?	5	
4	In relation to the frequency of an underwater acoustic signal, what is the tradeoff between vertical resolution and range?	5	
5	Describe a bar check procedure for single beam operations. Make sure you include a discussion on why and when this procedure is performed.	10	
6	Describe with the aid of a diagram how a target height is estimated from a side scan sonar image.	10	
7	In terms of Multibeam sonar systems, describe the difference between physical beam forming and electronic beam forming.	5	
8	Name three factors that affect alongtrack coverage with a multibeam system.	5	
9	For a deep water survey, would you use a high-frequency or low frequency multibeam system? Why?	5	
10	Why is vessel heading essential for multibeam operations and not as critical for singlebeam operations?	10	
11	With the help of diagrams, describe the tide generating forces.	10	
12	Describe how you would connect a local vertical datum to a newer vertical datum such as the Canadian Geodetic Vertical Datum 2013 (CGVD2013).	5	
13	What is the difference between mean sea level and the geoid?	5	
14	What is a chart datum and what is it used for?	5	
15	Describe the checks, verifications and calibrations and other quality control procedures you would typically carry prior to during and after an S44 1A Multibeam survey.	10	
		100	