

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

C12 - HYDROGRAPHIC SURVEYING		October 2025	
Note: This examination consists of 14 questions on 1 page.		Marks	
<u>Q. No</u>	<u>Time: 3 hours</u>	<u>Value</u>	<u>Earned</u>
1	Why is it critical that a hydrographic surveyor know the speed of sound in water?	5	
2	What is a CTD probe and what does it measure?	5	
3	Describe Snell's Law and how it is used in acoustic ray tracing.	10	
4	Draw two typical sound speed profiles in the open ocean, one at the equator and one in the arctic.		
5	Specific to hydrographic applications, describe the difference between Multibeam Sonars and Side Scan Sonars. Include a discussion of what each would be used for and why.	10	
6	With an equiangular multibeam setting, describe how beam footprint spacing will change from nadir to the outer beams.	5	
7	Name three factors that affect across-track coverage with a multibeam system.	5	
8	For a deep water survey, would you use a high-frequency or low frequency multibeam system? Why?	5	
9	Define Spring tide.	2.5	
10	Define Neap tide.	2.5	
11	Describe four different methods for measuring water levels. Include the type of instrument and measurement.	10	
12	With the help of a diagram, describe the relationship between ellipsoidal, geoidal and tidal vertical datums, as used in hydrographic operations. Explain how each are derived, what they are	10	
13	Why is vessel heading essential for multibeam operations and not as critical for singlebeam operations.	10	
14	You are tasked to conduct dredging surveys to determine volume removed and to ensure minimum depths met. Describe how you would conduct these operations, what equipment you would use, what datums, and what specifications you would try to meet.	20	
		100	