

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

C12 - HYDROGRAPHIC SURVEYING		October 2022	
Note: This examination consists of 12 questions on 1 page.		Marks	
Q. No	Time: 3 hours	Value	Earned
1.	Why is it critical that a hydrographic surveyor know the speed of sound in water?	5	
2.	Write the equation that relates frequency, wavelength and sound velocity.	5	
3.	Describe Snell's Law and how it is used in acoustic ray tracing.	10	
4.	How is Harmonic Mean Sound Speed computed in single beam depth reductions?	10	
5.	In relation to underwater acoustics define Linear Frequency Modulated (AKA CHIRP) pulse.	5	
6.	Describe a bar check procedure for single beam operations. Make sure you include a discussion on why and when this procedure is performed.	10	
7.	When using SSS, what factors must be considered when estimating across-track resolution?	5	
8.	You are tasked with finding a 20m long wreck in 200m of water in a 10km square area. What frequency would you use and how would you deploy your SSS? Explain your reasoning.	10	
9.	Describe the difference between beam forming and phase differencing multibeam systems.	10	
10.	You are tasked to select water level gauge site along a lake/river system that includes two lakes connected by a river. The upstream lake has a dam. Where would you place your water level monitoring stations?	10	
11.	Why is vessel heading essential for multibeam operations and not as critical for singlebeam operations?	10	
12.	What is IHO S-44 and what is it used for?	10	
		100	