

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

C12 - HYDROGRAPHIC SURVEYING		October 2019	
Note: This examination consists of 15 questions on 1 page.		Marks	
<u>Q. No</u>	<u>Time: 3 hours</u>	<u>Value</u>	<u>Earned</u>
1.	What is a CTD probe and what does it measure?	5	
2.	Describe Snell's Law and how it is used in acoustic ray tracing.	10	
3.	With the help of a diagram, describe the components necessary for reducing water depth measurements from a singlebeam transducer to a chart datum.	10	
4.	You are tasked with planning a singlebeam survey to IHO S-44 order 1B. The survey is in less than 10 m of water, in a coastal region, with both hard and soft bottom. Describe the equipment and methods you would use (with your reasoning) to conduct this survey.	10	
5.	Describe with the aid of a diagram how a target height is estimated from a side scan sonar image.	10	
6.	Define beam forming Multibeam.	2.5	
7.	Define phase differencing Multibeam.	2.5	
8.	Name three factors that affect across-track coverage with a multibeam system.	5	
9.	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 used for and how they are related to each other.	10	
10.	Provide 2 reasons for why it is desirable to take water level observations throughout the course of a hydrographic survey.	10	
11.	Define neap tide.	2.5	
12.	Define seiche.	2.5	
13.	What are crosscheck lines and what are they used for?	5	
14.	Describe the checks, verifications and calibrations and other quality control procedures you would typically carry out prior to, during, and after a survey.	10	
15.	What is an inertial measurement unit (IMU) and what does it measure?	5	
Total		100	