CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

	C12 - HYDROGRAPHIC SURVEYING	March 2019	
	Note: This examination consists of 14 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.	Name the three ocean parameters that effect sound velocity in the ocean.	5	
3.	Which of the three ocean parameters that affect sound velocity in the ocean has the greatest effect in the upper (near surface) region?	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.	Write the equation that describes the relationship between sound velocity (SV), depth (d) and the two-way-time of travel (TWTT).	5	
7.	When using SSS, what factors must be considered when estimating along-track resolution?	5	
8.	Describe with the aid of a diagram how a target height is estimated from a side scan sonar image.	10	
9.	In relation to multibeam technology, describe the difference between physical beam forming and electronic beam forming.	10	
10.	With an equiangular multibeam setting, describe how beam footprint spacing will change from nadir to the outer beams.	5	
11.	Name three vessel motion components that affect the vertical uncertainty of a multibeam sounding.	5	
12.	With the help of diagrams, describe the tide generating forces.	10	
13.	Provide two reasons why it is desirable to take water level observations throughout the course of a hydrographic survey.	10	
14	What is IHO S-44 and what is it used for?	10	
	Total	100	