

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

C12 - HYDROGRAPHIC SURVEYING		March 2018	
Note: This examination consists of 12 questions on 1 page.		Marks	
Q. No	Time: 3 hours	Value	Earned
1.	Please define the following in one or two sentences		
	a) Spring Tide	2	
	b) HAT	2	
	c) Semi-Diurnal Tide	2	
	d) CTD	2	
	e) Bandwidth	2	
	f) CHIRP	2	
	g) Heave	2	
	h) Harmonic Mean Sound Speed	2	
	i) Continuous Wave	2	
	j) Phase Differencing Multibeam	2	
2.	What multibeam systems would see transducers mounted on a boom? Use a diagram to help with your answer.	5	
3.	What factors affect the vertical resolution of a singlebeam echo sounder?	5	
4.	Describe two methods for measuring sound velocity.	10	
5.	What is a side or bow mounted transducer and what advantages does it have over a hull mounted transducer?	5	
6.	What is acoustic ray tracing?	5	
7.	Using a diagram, show how a single beam transducer's beamwidth affects the sounding's horizontal uncertainty.	5	
8.	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	
9.	Describe the basic principles of MBES transmit and receive beam forming and steering using flat transducers.	10	
10.	Name three vessel motion components that affect the horizontal uncertainty of a multibeam sounding.	5	
11.	With the help of a diagram describe the relationship between ellipsoidal and geoidal heights.	10	
12.	What is IHO S-44 and what is it used for?	10	
		100	