CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

	C12 - HYDROGRAPHIC SURVEYING	October 2017	
	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) Pulse Length	2	
	b) LAT	2	
	c) Diurnal tide	2	
	d) Seiche	2	
	e) SVP	2	
	f) Ellipsoid	2	
	g) Tide Staff	2	
	h) Vessel Pitch	2	
	i) Neap tide	2	
	j) ENC	2	
2.	Why is it critical that a hydrographic surveyor know the speed of sound in water?	5	
3.	Write the equation that relates frequency, wavelength and sound velocity.	5	
4.	Draw a typical sound velocity profile from the warm upper layers, through the thermocline to the deep ocean.	5	
5.	Why is it necessary to apply pitch and roll observations to narrow-angle single beam transducers and not wide-angle single beam transducers, under normal survey conditions? Use a diagram in your answer.	10	
6.	What is the relationship between transducer size and its beamwidth?	5	
7.	Describe a bar check procedure for single beam operations. Make sure you include a discussion on why and when this procedure is performed.	10	
8.	What multibeam setting would you change to help compensate for increased vessel speed?	5	
9.	Describe the basic principles of MBES transmit and receive beam forming and steering using curved transducers.	10	
10.	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	
11.	What is the vertical datum used on nautical charts and how does it differ from a geodetic vertical datum?	5	
12.	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.	10	
		100	