CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

		C12 - HYDROGRAPHIC SURVEYING	March 2016	
		Note: This examination consists of 9 questions on 1 page.	**Marks**	
Q. No	Time: 3 hours		Value	Earned
1.	Please define the following in one or two sentences			
	a) Cavitation		2	
	b) S-44		2	
	c) Shoal Exam		2	
	d) Lead Line		2	
	e) Backscatter		2	
	f) Beam Width		2	
	g) Ebb Tide		2	
	h) Neap Tide		2	
	i) Patch Test		2	
	j) SSS		2	
2.	With the help of a diagram, describe the components necessary for reducing water depth measurements from a singlebeam transducer face to a chart datum.		7	
	Describe three of the main sources of vertical uncertainty involved in this reduction.		3	
3.	In terms of acoustic transducer design, what are the trade-offs between the acoustic pulse duration and system resolution?		6	
	How is the beam width of a single beam transducer defined, in terms of intensity loss in dB? What is it in percent?		4	
4.	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	
5.	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	
6.	Describe the principles of long, short and ultra-short baseline acoustic positioning system modes.		10	
7.	Summarize the differences between beam forming and phase differencing multibeam systems.		10	
8.	Describe the purposes of nautical charting surveys including all essential data to ensure safety of navigation. Describe everything you would take into account in order to plan and conduct a hydrographic survey for charting.		10	
9.	Compare and contrast the use of multi-beam versus airborn bathymetric LiDAR in hydrography. Include descriptions of when, where and why LiDAR is more suitable than the MB and vise versa.		10	
			100	