ASSOCIATION OF CANADA LANDS SURVEYORS - BOARD OF EXAMINERS WESTERN CANADIAN BOARD OF EXAMINERS FOR LAND SURVEYORS ATLANTIC PROVINCES BOARD OF EXAMINERS FOR LAND SURVEYORS

SCHEDULE II / ITEM 2 HYDROGRAPHIC SURVEYING AND OCEANOGRAPHY

Time: 3 hours

February 2001 (1990 Regulations)

This examination consists of 3 questions on 1 page

Q. No.

(Closed Book)

Marks

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1	Oceanography	
	(a) Describe what the Beaufort scale is and how it is used. Give a few numerical examples	6
	(b) Enumerate three major types of ocean currents and explain their directions on the earth's surface	6
	(c) Describe the geostrophic equation and its significance in physical oceanography	6
	(d) Describe what a rip current is and its danger (In Spring 2000, Canadian tourists walking on a beach in Northern California drowned as a result of a rip current)	6
	(e) Why was the 1988 North American Vertical Datum not held fixed at tidal gauges on both the Atlantic and Pacific coasts?	6
	(f) Why are tides much higher in certain areas such as the Bay of Fundy? What is the maximum tide expected in the ocean, far from any shore?	6
2	<u>Underwater Acoustics</u>	
	(a) Classify and describe the major sonar parameters	14
	(b) Describe the effect of water temperature, salinity and pressure changes on the speed of an underwater acoustic wave	10
	(c) What are the two major transmission losses? Give quantitative estimates as a function of water depth	10
	(d) What are the sonar equations? Give two examples. How are they used in hydrography?	10
3	Design of an Hydrographic Survey	
	Select and describe a method, together with all relevant system technical	
	parameters required, to survey a constricted navigation channel that has a depth of up to 50 m using IHO S-44 Order 1 specifications. Assume that you can	
	position the hydrographic ship using DGPS with a 2DRMS accuracy of 1 m.	20

Total Marks: 100