

CANADIAN BOARD OF EXAMINERS FOR PROFESSIONAL SURVEYORS

**SCHEDULE II / ITEM 2
HYDROGRAPHIC SURVEYING & OCEANOGRAPHY**

October 2009

Note: This examination consists of 7 questions on 2 pages.

Marks

Q.No

Time: 3 hours

Value Earned

1.	Define each of the following terms: a) avulsion b) foul bottom (or foul ground) c) cavitation d) groin (or groyne) e) kelp f) seiche g) thermocline h) windward i) sea mile j) abyssal	20	
2.	a) Describe the factors that affect the speed of sound of an acoustic wave in water. b) Describe the process of calibrating a single beam echo sounder. c) Why would you use a 200 kHz transducer rather than a 28 kHz transducer (single beam echo sounder)?	5 5 5	
3.	a) How do you determine whether a co-tidal chart is required for a designated sounding survey? b) Normally, in taking water level measurements over medium-long periods, both an automatic water level gauge and a tide staff are installed. Why? c) Explain harmonic and non-harmonic tidal constituents.	5 5 5	
4.	During the course of a hydrographic survey, an underwater feature was discovered at a harbour entrance. During the shoal examination process it is determined that the least depth obtained by lead line was 5.3 metres and the least depth obtained using a 30 kHz single-beam echo sounder was 4.7 metres. Explain why this discrepancy may occur.	15	
5.	a) Why is the (vessel) line spacing different for a hydrographic survey being conducted using a single beam echo sounder rather than a multibeam echo sounding system? b) What are some of the main differences between an electronic chart system utilizing raster data and a system using vector data?	5 5	

6.	<p>a) Why is it essential that a hydrographic surveyor know the heave, roll and pitch of a vessel in conducting a hydrographic survey?</p> <p>b) During the conduct of a hydrographic survey, it is determined that large amounts of underwater growth (eel grass, weeds, kelp) is hampering the echo sounder in obtaining true depth. In these areas of heavy underwater growth, what methods could you use to obtain true depth? Why?</p>	5	
7.	<p>A major charting program is required in Lewisporte, Newfoundland to facilitate recreational boating, commercial shipping, and the fishing industry. A hydrographic survey is being conducted to produce a chart at a scale of 1:60,000. Two chart insets, each at a scale of 1:5,000, is required for berthing/docking many different types of vessels.</p> <p>Your company is going to submit a proposal (bid) to conduct the surveys, and you are part of a team preparing the submission.</p> <p>Compile a list of questions/issues you have to address in order to prepare the documentation.</p>	15	
Total Marks:		100	