



UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: GM 472

COURSE NAME: Hydrographic Surveying

CLASS: GM IV

TIME: 4 HOURS

Name: _____

Index Number: _____

Attempt All Questions

Question 1

- a) Briefly explain a role you will play in the determination of the discharge of river bediebewo during a typical field work.
- b) In order to determine the position of the sounding boat O in the river bediebewo, observations were made from the sounding boat O with a sextant to obtain the following data:

$$\angle AOB = 50^\circ 30'$$

$$\angle BOC = 27^\circ 30'$$

$$\angle ABC = 162^\circ 50'$$

$$AB = 340 \text{ m;}$$

$$BC = 220 \text{ m}$$

The position of the boat was on the opposite side of B, when AC is joined. Compute the lengths of the lines AO and CO to establish O by the method of RESECTION

Question 2

- a) The government intends to develop “*The Ghana National Maritime Policy Framework*” which will deal with the measurement and description of features of the sea and coastal areas for the primary purpose of navigation and all other marine purposes and activities, including offshore activities, research, protection of the environment, and prediction services. This framework must address specific areas and will necessitate decisive information. As a Geomatic Engineer with basic knowledge in International Hydrographic Organisation Standards, share your thoughts on the nature, specific areas and the critical information of the policy framework.
- b) The Hydrographic Service of the Survey and Mapping Division has been contacted by the Committee on the development of “*The Ghana National Maritime Policy Framework*” to help

them structure a section on the development of hydrocarbon industry. Provide the committee with **ONLY three** fundamental elements needed.

- c) State two instruments that may be necessary in areas where thin and dangerous obstacles may be encountered.

Question 3

- a) A team of Hydrographic Surveyors and Mechanical Engineers are required to design an automatic tide gauge for Committee on the development of “*The Ghana National Maritime Policy Framework*”. The team intends to, install a visual staff gauge, mount instrument on the side of an underwater structure, and provide a sinker as well as additional circuit boards in the display unit. As a member of the team, explain to the Committee the reasons for each of the team’s intentions.
- b) State five advantages of using an echo sounder and briefly describe how you will calibrate it directly.
- c) Briefly explain the purpose of sweeping and why it is necessary in sounding operations.

Question 4

- a) How will you ascertain the stability of a horizontal shore control?
- b) Given a scale of 1: 5 000 in a hydrographical survey contract document, determine the following: (i) the spacing between the sounding lines (ii) the interval between fixes along sounding lines (iii) the speed of the boat (iv) the direction of the sounding lines
- c) With the aid of a diagram, describe the field method generally employed to determine discharge of a stream.

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