Civil Engineering Licensure Exam – Mock Exam (Day 12: Hydrographic and Topographic Surveys)

February 24, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Hydrographic and Topographic Surveys
- Total Questions: 10 (Multiple Choice & Problem-Solving)
- Show complete solutions for problem-solving questions.

Section A: Multiple Choice Questions (MCQs)

Choose the best answer.

1. Hydrographic surveying is primarily concerned with:
   (a) Measuring elevation changes
   (b) Determining water depths and underwater features
   (c) Measuring land distances and angles
   (d) Identifying property boundaries
2. The instrument commonly used in hydrographic surveying for depth measurement is:
   (a) Theodolite
   (b) Total Station

(c) Echo Sounder

(d) GPS Receiver

3. A topographic map primarily represents:

   (a) Water depths and underwater features

   (b) Elevation contours and landforms

   (c) Road networks and city layouts

   (d) Property lines and boundaries

4. The contour interval of a topographic map depends on:

   (a) The scale of the map

   (b) The terrain steepness

   (c) The surveying accuracy

   (d) All of the above

5. In hydrographic surveying, the position of a survey vessel is determined using:

   (a) Triangulation

   (b) GPS and sonar

   (c) Compass bearings

   (d) Direct leveling

Section B: Problem-Solving

1. A riverbed is surveyed using an echo sounder, and the depth readings at 5 m intervals are: 2.5 m, 3.0 m, 4.2 m, 3.8 m, and 3.5 m. Determine the average depth.

2. A topographic survey shows contour lines spaced 5 meters apart on a 1:1000 scale map. Calculate the actual ground distance between two contour lines.

3. A hydrographic survey is conducted over a 500 m stretch of river with an average depth of 3.2 m. Determine the estimated cross-sectional area if the river width is 20 m.

4. Using the trapezoidal rule, calculate the volume of water in a canal section with depths at 5 m intervals recorded as: 2.5 m, 3.5 m, 4.0 m, 4.2 m, and 3.8 m. The canal width is 15 m.

5. A topographic surveyor needs to determine the elevation of a point using differential leveling. The backsight (BS) is 1.75 m, and the foresight (FS) is 2.25 m. If the reference benchmark has an RL of 150.00 m, determine the elevation of the point.