Civil Engineering Licensure Exam – Mock Exam (Day 10: Leveling, Traverse Computation, and Land Area Calculations)

February 24, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Leveling, Traverse Computation, and Land Area Calculations
- 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. The rise and fall method in leveling is used to determine:
   (a) Horizontal distances
   (b) Elevation differences
   (c) Traverse closures
   (d) Angular errors
2. If the sum of back sights is greater than the sum of foresights in leveling, the final RL (Reduced Level) will be:
   (a) Higher than the initial RL

(b) Lower than the initial RL

(c) Equal to the initial RL

(d) Unchanged

3. In a closed traverse, the sum of the latitudes should be:

   (a) Equal to the sum of departures

   (b) Equal to zero

   (c) Greater than zero

   (d) Less than zero

4. The area of an irregular field is best determined using:

   (a) The trapezoidal rule

   (b) The mid-ordinate rule

   (c) Simpson's rule

   (d) All of the above

5. A traverse is said to be closed when:

   (a) The sum of interior angles equals $(n-2) \times 180^\circ$

   (b) The sum of latitudes equals the sum of departures

   (c) The first and last points coincide

   (d) All of the above

Section B: Problem-Solving

1. Compute the RL of a station if the benchmark RL is 200.00 m, the backsight (BS) is 2.10 m, and the foresight (FS) is 1.65 m.

2. A surveyor measured the following traverse bearings:

$$A - B : 45^\circ, \quad B - C : 120^\circ, \quad C - D : 200^\circ, \quad D - A : 310^\circ$$

   Determine whether the traverse is closed.

3. Compute the area of a plot of land using the trapezoidal rule with the following distances (in meters):

$$10, 12, 15, 18, 20$$

   with an interval of 5 m.

4. Compute the total correction needed if a 30-meter tape was found to be 0.02 m too long and the total measured distance was 600 m.

5. A leveling instrument is set up at a midpoint between two points A and B, with respective readings of 1.35 m and 0.85 m. Find the height difference between A and B.