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

February 24, 2025

Answer Key

Section A: Multiple Choice Solutions

1. The rise and fall method determines: **(b) Elevation differences**

2. If the sum of back sights is greater than foresights: **(a) Higher than the initial RL**

3. In a closed traverse, sum of latitudes should be: **(b) Equal to zero**

4. Best method for irregular land area: **(d) All of the above**

5. A traverse is closed if: **(d) All of the above**

Section B: Problem-Solving Solutions

1. Compute RL:
$$RL_{\text{station}} = RL_{\text{BM}} + BS - FS$$
$$RL_{\text{station}} = 200.00 + 2.10 - 1.65 = 200.45 \text{ m}$$

2. Traverse closure check:

$$\sum \text{bearings} = 45° + 120° + 200° + 310° = 675°$$

$$\text{Sum should be } 360° \times \text{(n-2)} = 360°$$

Traverse is NOT closed.

3. Trapezoidal rule for land area:

$$A = \frac{h}{2}[d_1 + 2(d_2 + d_3 + d_4) + d_5]$$

$$A = \frac{5}{2}[10 + 2(12 + 15 + 18) + 20]$$

$$A = \frac{5}{2} \times (10 + 90 + 20) = \frac{5}{2} \times 120 = 300 \text{ m}^2$$

4. Correction for tape length:

$$C = L_{\text{measured}} \times \frac{L_{\text{actual}}}{L_{\text{nominal}}}$$

$$C = 600 \times \frac{30.02}{30} = 600.4 \text{ m}$$

5. Height difference between A and B:

$$h = 1.35 - 0.85 = 0.50 \text{ m}$$