Answer Key: Civil Engineering Licensure Exam – Mock Exam (Day 13: Survey Computations and Map Reading)

February 24, 2025

Answer Key

Section A: Multiple Choice Solutions

1. Scale conversion:

$$10 \text{ cm} \times 5000 = 50000 \text{ cm} = 500 \text{ m}$$

   Answer: (b) 500 m

2. Contour lines represent: **(b) Points of equal elevation**
3. Common projection for topographic maps: **(b) Conical**
4. Sum of latitudes in a traverse: **(a) Equal to zero**
5. Best method for field area calculation: **(c) Both (a) and (b)**

Section B: Problem-Solving Solutions

1. Scale conversion:

$$15 \text{ cm} \times 2000 = 30000 \text{ cm} = 300 \text{ m}$$

2. Latitude misclosure:

$$\sum \text{Latitudes} = 250 - 150 + 100 - 200 = 0$$

   Traverse is balanced.

3. Trapezoidal rule for area:

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

$$A = \frac{1}{2}\left[50 + 2(60 + 40) + 45\right]$$

$$A = \frac{1}{2} \times 255 = 127.5 \text{ m}^2$$

4. Vertical exaggeration:

$$\text{VE} = \frac{\text{Map Scale Denominator}}{\text{Contour Interval}}$$

$$VE = \frac{10000}{5} = 2000$$

5. Missing bearing angle:

$$\sum \text{Bearings} = 360^\circ$$

$$x = 360^\circ - (45^\circ + 130^\circ + 220^\circ) = -35^\circ$$

Since bearings are always positive, we use $x = 35^\circ$.