Civil Engineering Licensure Exam – Mock Exam (Day 14: Errors in Surveying, Precision, and Adjustments)

February 24, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Errors in Surveying, Precision, and Adjustments
- 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. A systematic error in surveying is:
   (a) A mistake in reading measurements
   (b) An error that follows a predictable pattern
   (c) An error due to human carelessness
   (d) An error that has no definite cause
2. Random errors in measurements:
   (a) Can be completely eliminated
   (b) Follow a known trend
   (c) Occur without a definite pattern

(d) Are always large in magnitude

3. The probability of small errors occurring in a survey is:

   (a) Less than that of large errors
   (b) Greater than that of large errors
   (c) Equal to that of large errors
   (d) Unpredictable

4. The precision of a measurement refers to:

   (a) How close a measured value is to the true value
   (b) The consistency of repeated measurements
   (c) The smallest unit of measurement available
   (d) The accuracy of the instrument used

5. The correction to a linear measurement when a tape is too long is:

   (a) Always positive
   (b) Always negative
   (c) Either positive or negative depending on error type
   (d) Zero

Section B: Problem-Solving

1. A line was measured as 250 m using a tape that was 0.02 m too short. Compute the corrected length of the line.

2. A surveyor measured a distance of 600 m, but the true distance was found to be 598.5 m. Compute the relative error.

3. If an instrument has a standard deviation of 0.02 m, find the probable error of a single measurement using the equation:

$$PE = 0.6745 \times \sigma$$

4. A surveying team recorded the following measurements for a distance: 100.2 m, 100.3 m, 100.1 m, and 100.4 m. Compute the mean and standard deviation.

5. A tape of 30 m length was used to measure a distance of 450 m. If the tape was actually 30.02 m long, find the corrected distance.