



# UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

## SECOND SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: GM 274

COURSE NAME: SURVEY ADJUSTMENT AND COMPUTATIONS

CLASS: GM II

TIME: 3HRS

Name: \_\_\_\_\_ Index Number: \_\_\_\_\_

### ANSWER ALL QUESTIONS

**Q1.** A level having a collimation error of 0.04 mm/m is used on a level line where the backsight distances sum to 863 m and the foresight distances sum to 932 m. If the elevation differences observed for the line is 22.865 m, what is the corrected elevation difference? **[10 marks]**

**Q2.** The estimated error in leveling for an automatic compensator or level vial is generally given in the technical data for each instrument. For precise levels, this information is usually listed in arc seconds or as estimated elevation error for a given distance. As an example, the estimated error may be listed as  $\pm 1.5 \text{ mm/km}$ . Express the estimated elevation error in arc seconds. **[4 marks]**

**Q3:** Name and explain three sample distributions used for describing or quantifying the reliability of mean and variance estimates? **[6 marks]**

**Q4:** Explain the following terms: **[10 marks]**

- (a) Standard deviation
- (b) Accuracy
- (c) Precision
- (d) Dispersion
- (e) Residual

**Q5:** In surveying and mapping projects, before data is utilized it must be processed due to the fact that every measurement contain errors. Outline two steps involved in accounting for the existence of errors in field measurements. **[4 marks]**

**Q6:** Determine the latitude and departure as well as the standard deviations given a traverse leg of length  $456.87 \pm 0.02 \text{ ft}$  and a bearing of  $23^\circ 25'26'' \pm 9''$ . Note that the length and bearing have their respective standard deviations computed as indicated. **[20 marks]**

**Q7.** A blunder is an unpredictable gross mistake made during surveying. It is not a hidden error that will go unnoticed but usually it becomes apparent that something is wrong with the measurements. Give six (6) examples of these blunders. **[6 marks]**