

ASSIGNMENT: 8 THEORY OF ERROR

- Q.1** Explain the theory of least squares.
- Q.2** Explain “Laws of Weights”.
- Q.3** What are the various types of errors in surveying measurements? Give one example of each. Define weight of a quantity.
- Q.4** Explain the method of correlates. What are its advantages over the normal equation method?
- Q.5** Define : (i) True Error (ii) Most Probable error (iii) Residual error.
- Q.6** Define accidental error, true value, direct observation, conditioned quantity, most probable value, true error, normal equation.
- Q.7** Determine the most probable values of the angles of a triangle ABC, given by the following data.
 $\angle A = 62^{\circ} 14' 12''$ Weight = 1
 $\angle B = 48^{\circ} 12' 14''$ Weight = 3
 $\angle C = 69^{\circ} 33' 28''$ Weight = 2
- Q.8** The observed values of an angle are given below :

Angle	Weight
$85^{\circ} 40' 20''$	2
$85^{\circ} 40' 18''$	2
$85^{\circ} 40' 19''$	3

- Find (i) probable error of single observation values of unit weight
(ii) probable error of weighted arithmetic mean
(iii) Probable error of single observation of weight 3.

- Q.9** The following are the angles observed at a triangular traverse along with their probable errors. Determine correct values of angles
 $\angle A = 64^{\circ} 12' 12'' \pm 02''$
 $\angle B = 50^{\circ} 48' 30'' \pm 04''$
 $\angle C = 64^{\circ} 59' 08'' \pm 05''$
- Q.10** Enlist the rules should be applied for the distribution of errors of the field measurements. The following are the three angles observed at a station closing the horizon, along with their probable errors of measurements. Determine their corrected values.
 $A = 85^{\circ} 13' 10'' \pm 2''$, $B = 130^{\circ} 49' 30'' \pm 3''$, $C = 143^{\circ} 57' 10'' \pm 4''$