

Time: Three Hours

Maximum Marks: 80

“Please check whether you have got the right question paper.”

- i) Q. No.1 and Q. No. 6 are compulsory.
- ii) Answer any two questions from each section from remaining questions
- iii) Figure to right indicates full marks.
- iv) Assume suitable data wherever necessary.

SECTION-A

- Q.1 Answer the following (any five) 10
- 1) What is the principle of triangulation in surveying?
 - 2) Give the classification of Triangulation system.
 - 3) What is meant by eccentricity of signal?
 - 4) State different methods of correlates.
 - 5) State the principle of least squares.
 - 6) How would you determine the inter visibility of Triangulation station?
 - 7) Enlist various types of signals.
 - 8) Give the mathematical expression for the correction to be applied to cylindrical signals.
- Q.2 a) What is meant by satellite station and reduction to centre? Derive the expression when the satellite station is measured from left of true station. 08
- b) Explain any one method to complete the sides of spherical triangle. 07
- Q.3 a) In Triangulation adjustment state laws of weights. 08
- b) What is phase of signal? Derive formula for the correction to be applied to cylindrical signal when the bright portion is bisected. 07
- Q.4 a) What is the most probable value? Explain in detail how it is determined. 07
- b) Find the most probable values of the angles A and B from the following observation at a station o: 08
- A=19°48' 36.6" weight 2
B=54°37' 48.3" weight 3
A + B=105°26' 28.5" weight 4
- Q.5 Write short notes on: (any three) 15
- 1) City surveying
 - 2) Topographical survey
 - 3) Adjustment of a quadrilateral with a central station by method of least squares.
 - 4) Base line measurements.
 - 5) Towers in Geodetic surveying.

SECTION-B

- Q.6 Answer the following: (any five) 10
- 1) Define simple circular curve.
 - 2) Give the relation between radius of curve and degree of curve.
 - 3) What do the term 'rear tangent' and 'forward tangent' means?
 - 4) Define super elevation. Why is it provided?
 - 5) Give mathematical expression for Apex distance in simple circular curve.
 - 6) Enlist different types of electronic distance measurement instrument.
 - 7) State the properties of electromagnetic waves.
 - 8) State the difference between single plane and double plane method.

- Q.7 a) Explain the various methods of determining the length of transition curve. 07
b) Describe how would you set a simple circular curve by Rankines deflection angle method. 08
- Q.8 a) Derive the relationship between the parts of compound curve. If Δ, T_s, T_l and R_s is given. Required Δ_1, Δ_2 and R_L . 07
b) Explain modulation in E.D.M 08
- Q.9 a) Explain fundamental measurements in total station. 07
b) Find the R.L of Q from the following observations: 08
Horizontal distance between P & Q = 9290m
Angle of elevation from P to Q= $2^{\circ}06'18''$
Height of signal at Q= 3.96 m
Height of instrument at p=1.25m
Coefficient of refraction= 0.07
 $R \sin 1''=30.88\text{m}$
R.L. of P=400m.
- Q.10 Write short notes on (any three) 15
1) Ideal transition curve.
2) Shift of curve.
3) Axis signal correction.
4) Correction for curvature and refraction.
5) Lemniscates curve