Advanced Surveying (313321)

MSBTE Diploma · K-Scheme · Model Question Paper — Set B

Time: 3 Hours **Max. Marks: 70**

Instructions:

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following: **10**

a) Write the formula for horizontal distance by a tacheometer when the line of sight is horizontal and the staff is held vertical. State the meaning of each term.

b) State the necessity of providing curves on roads and railways (any two).

c) Define degree of curve.

d) State any four uses of a digital theodolite.

e) Define remote sensing.

f) Define GPS. State any two applications of GPS.

g) Define the term ‘aerial surveying’.

Q.2 Attempt any THREE of the following: **12**

a) Explain the principle of tacheometric survey with a neat sketch.

b) Differentiate between theodolite and tacheometer w.r.t. accuracy, measurement, suitability and number of stations required.

c) Enlist the types of curves used in road and railway alignment. Draw neat sketches.

d) State four advantages of a total station.

Q.3 Attempt any THREE of the following: **12**

a) A tacheometer with anallatic lens (K = 100) was set up at station P with height of instrument 1.450 m. The staff was held vertically at Q and the readings with horizontal line of sight were 1.755, 2.215 and 2.675 m. If the RL of P is 120.000 m, determine the horizontal distance PQ, the RL of Q and the gradient from P to Q.

b) Explain the procedure of measurement of vertical angle using a digital theodolite.

c) Describe the sources of errors in a total station.

d) State and explain four applications of GIS.

Q.4 Attempt any THREE of the following: **12**

a) State the meaning of anallatic lens in a tacheometer. Also state its purpose.

b) Derive the relation between the radius and degree of a curve.

c) Draw a neat sketch of a digital theodolite and label any eight parts.

d) Explain geo-fencing.

e) Explain how remote sensing is applied to land-use mapping.

Q.5 Attempt any TWO of the following: **12**

a) To determine the constants of a tacheometer, the following readings were taken on a vertically held staff with the line of sight horizontal:

Horizontal distance (m)	Stadia readings (m)
60	1.201, 1.500, 1.799
150	0.751, 1.500, 2.249

Calculate the multiplying and additive constants.

b) Calculate the ordinates at 20 m intervals to set out a circular curve having a long chord of 200 m and a versed sine of 8 m.

c) Explain the procedure of measuring horizontal distance and horizontal angle with a total station.

Q.6 Attempt any TWO of the following: **12**

a) Two tangents intersect at a chainage of 1190.00 m, the deflection angle being 36°. Calculate the data for setting out a simple circular curve of 300 m radius by Rankine's method of deflection angles, taking peg interval of 20 m.

b) Define GPS. Explain its segments and enlist applications of GPS in civil engineering.

c) Enlist merits and demerits of photogrammetry.

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in