# Advanced Surveying (313321)

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

**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) State the principle of tacheometry.

b) Define: i) Simple circular curve ii) Reverse curve.

c) State the relation between radius and degree of a curve (for 30 m arc length).

d) List any four component parts of an EDM instrument.

e) Define the term ‘remote sensing’.

f) Name any two software used for GIS.

g) State any two merits of photogrammetric surveying.

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

a) State any four situations where tacheometric surveying is preferred.

b) Describe the field method of determining the constants of a tacheometer.

c) Draw a neat sketch of a simple circular curve and show on it: i) Tangent length ii) Deflection angle iii) Apex distance iv) Long chord.

d) Explain the procedure of measuring a horizontal angle with a digital theodolite.

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

a) Two straights intersect at a chainage of 1450.60 m, the deflection angle being 38°. A simple circular curve of 250 m radius is to be set out. Calculate: i) Tangent length ii) Length of curve iii) Length of long chord iv) Chainages of the two tangent points.

b) Explain the principle of EDM with a neat sketch.

c) List any four function keys of a total station and state their use.

d) Differentiate between active and passive remote sensing systems (any four points).

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

a) Describe the essential characteristics of a tacheometer.

b) State and explain the key components of GIS.

c) Define GPS. Explain its three segments with a neat sketch.

d) Explain the classification of drones as per DGCA.

e) Explain any two applications of photogrammetry in civil engineering.

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

a) A tacheometer fitted with an anallatic lens (multiplying constant 100) was set up at station O and the following readings were taken on a vertically held staff:

| Inst. station | Staff station | Vertical angle | Stadia readings (m) | Remark |
|---|---|---|---|---|
| O | B.M. | +6°20′ | 1.150, 1.425, 1.700 | RL of B.M. = 245.500 m |
| O | P | −4°10′ | 0.985, 1.360, 1.735 | |

Find the horizontal distance OP and the RL of P.

b) The following observations were taken with a tacheometer on a vertically held staff, the line of sight being horizontal. Determine the multiplying and additive constants of the tacheometer.

| Horizontal distance (m) | Stadia readings (m) |
|---|---|
| 50 | 1.152, 1.400, 1.648 |
| 150 | 0.852, 1.600, 2.348 |

c) Calculate the ordinates at 10 m intervals to set out a simple circular curve of radius 280 m on a long chord of 120 m. Illustrate your answer with a neat sketch.

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

a) Describe the stepwise procedure of contouring with a total station.

b) Explain any three applications of remote sensing in civil engineering.

c) Explain the setting out of a simple circular curve by Rankine's method of deflection angles.

**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