

313321

24225

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answer with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following:** **10**
 - a) Mention the statement of principle of tacheometry.
 - b) Write any two objects of tacheometry.
 - c) Define horizontal and vertical curve.
 - d) Write the relationship between radius and degree of curve.
 - e) List component parts of EDM.
 - f) Name any two software for GIS.
 - g) Define the term 'remote sensing'.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Describe essential characteristics of a tacheometer.
 - b) Differentiate between theodolite and tacheometer w.r.t. accuracy, measurement, suitability, no. of stations required.
 - c) Write the procedure of setting out a curve by Rankine's method of deflection angles.
 - d) Explain four properties of a simple circular curve.
- 3. Attempt any THREE of the following:** **12**
- a) Write any four uses of EDM.
 - b) Explain the procedure of measurement of horizontal angle by using digital theodolite.
 - c) Describe the sources of errors in total station.
 - d) Explain the procedure of measurement of horizontal distance using total station.
- 4. Attempt any THREE of the following:** **12**
- a) Define the following terms and give any two components of each –
 - i) GIS
 - ii) GPS.
 - b) Write any four uses of aerial surveying.
 - c) State and explain any one method of aerial surveying.
 - d) Mention any two merits and demerits of photogrammetry surveying.
 - e) Explain any two applications of photogrammetry to civil engineering.

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

- a) A tacheometer was set up at a station “C” and following readings were taken on a staff held vertically.

Station	Staff Station	Vertical angle	Stadia hair readings	Remark
C	BM	+9°31'	0.950, 1.055, 1.160	RL of Big
C	E	−3°0'	1.050, 1.105, 1.160	= 400 M

The constants of tacheometer were 100 and 0.4 respectively. Determine the distance “CE” and RL at “E”.

- b) The following observations were made by tacheometer. Find the tacheometric constants. Consider, line of sight is horizontal and staff held vertical.

Distance (m)	90	130
Stadia readings (m)	2.345, 3.100, 3.550	2.245, 2.470, 2.755

- c) Calculate the ordinates from long chord to set out a simple circular curve at 5 m interval of radius 250 m and a long chord length of 80 m. Justify your answer with neat sketch.

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

- a) Describe stepwise procedure of contouring with total station.
 b) Write sources of errors in GIS.
 c) Explain any three applications of remote sensing.
