313321

12425

03 Hours / 70 Marks Seat No. | | | | | | | | |

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 Examination Hall.

Marks

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

a) Recall the formula for calculating horizontal distance by using tacheometer when line of sight is horizontal and staff held vertical.

b) Classify horizontal and vertical curve.

c) Enlist component parts of digital theodolite.

d) Define active system and passive system.

e) Define electromagnetic energy.

f) Under what situations you would adopt tacheometer.

g) State the necessity of curve

Marks

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

a) Explain principle of Tacheometer.

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

c) Draw a neat sketch of circular curve and show notation there on.

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

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

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

b) Explain principle of EDM with neat sketch.

c) List any four function keys of total station with its uses.

d) Explain the procedure of measurement of horizontal angle using total station.

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

a) Explain any two applications of remote sensing.

b) Explain the classification of drones as per DGCA.

c) Explain any two salient features of drones.

d) Explain geo-fencing.

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

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

a) A tacheometer fitted with anallatic lens was set up at station 'O' and the following readings were taken on a staff held vertical.

Instrument station	Staff Station	Vertical angle	Staff reading
O	B.M.	+7°30'	0.900, 1.200, 1.500
O	B	–2°30'	1.100, 1.350, 1.600

Find the horizontal distance OB and RL of 'B' if R.L. of B.M. is 50.00 M. Take the constant of tacheometer as 100.

Marks

b) To determine value of multiplying constant of a tacheometer the following observations were taken on a staff held vertically at a distance measured from the instrument station.

Observation No.	Horizontal distance in m	vertical angle	stadia reading (m)
1	80	0º0'0"	0.800, 1.200, 1.600
2	112	0º0'0"	1.110, 1.670, 2.230

Calculate the value of the multiplying constant and value of additive constant.

c) Calculate the ordinates at 25 m interval to set a circular curve having long chord of 300 m and versed sign of 10 m.

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

a) Describe stepwise procedure for preparation of layout of small building by total station.

b) Explain any two applications of remote sensing to civil engineering.

c) Explain any two application of GIS.