22301

11920

3 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) State two advantages of plane table surveying.

b) Define Swinging and Transiting.

c) Define Latitude and Departure.

d) State the function of Anallatic lens.

e) Define 'degree of a curve'.

f) List two uses of EDM.

g) Name two software for GPS.

Marks

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

a) Describe any one method of orientation of plane table surveying.

b) State and explain temporary adjustments of Theodolite.

c) Explain the principle of Tacheometry with the help of a neat sketch.

d) Draw a simple circular curve and show the following on it.

(i) Forward tangent

(ii) Long chord

(iii) Deflection angle

(iv) Apex distance

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

a) Describe the procedure for measurement of horizontal angle by repetition method.

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

c) Describe the procedure to measure vertical angle by using electronic thedolite.

d) Describe the procedure to determine co-ordinates of a station using GPS.

Marks

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

a) Compare radiation and intersection methods of plane table surveying on any two parameters.

b) Following are the lengths and bearings of a closed traverse ABCDA.

Line	Length (m)	Bearing
AB	258.0	30°
BC	321.0	140°
CD	180.0	210°
DA	?	?

Calculate the length and bearing of Line DA.

c) Following are the corrected latitudes and departures of a closed traverse. Find the independent co-ordinates of the points of traverse.

Side	Latitude	Departure
AB	+ 225.5	+ 120.5
BC	– 245.0	+ 210.0
CD	– 150.5	– 110.5
DA	+ 170.0	– 220.0

d) Following observations were taken to determine the constants of tacheometer.

Station	Staff Station	Horizontal distance (m)	Vertical angle	Hair Readings	
				Lower	Upper
A	B	51.430	6°30′	0.900	1.420
A	C	18.065	2°20′	1.140	1.320

Determine the constants.

e) Calculate the ordinates from long chord to set a circular curve at 10 m interval given that the length of long chord is 60 m and radius of the curve is 180 m.

Marks

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

a) The following angles were measured in running a closed traverse ABCDEA.

$\angle A = 87° 50' 20''$, $\angle B = 114° 55' 40''$, $\angle C = 94° 38' 50''$, $\angle D = 129° 40' 40''$ and $\angle E = 112° 54' 30''$.

If the bearing of line AB is $221° 18' 40''$, calculate bearings of the remaining lines.

b) Calculate the corrected consecutive co-ordinates for the following traverse. Apply Bowditch Rule.

Line	Length in 'm'	Latitude	Departure
AB	335	– 334.91	– 7.80
BC	850	– 4.95	+ 849.99
CD	408	+ 407.44	– 21.35
DA	828	– 72.17	– 824.85

c) A tacheometer was set up at a station P and following readings were taken on a vertically held staff. The constant of the instrument was 100.

Station	Staff Station	Vertical angle	Hair Reading	Remarks
P	BM	– 4° 0′	1.050, 1.105, 1.160	RL of BM = 200 m
P	Q	+ 10°0′	0.950, 1.055, 1.160	

The instrument was fitted with anallatic lens. Determine distance PQ and RL of Q.

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

a) Describe step wise procedure to prepare the layout of a small building using total station.

b) Apply knowledge of total station to prepare a contour map by describing its procedure.

c) Demonstrate the utility of Remote Sensing and GIS applications in Civil Engineering with appropriate examples.