17419

15162

3 Hours / 100 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) 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. a) **Attempt any SIX of the following:** **12**

(i) In a contour map, if contours are crossing each other, what will be the nature of topography? Draw the sketch to support your answer.

(ii) What is a contour map? Write any two objects of preparing a contour map.

(iii) Give the simplest method for finding the area of a zero circle from manufacturers table.

(iv) Write the use of Gale's table.

(v) State any four uses of transit theodolite.

(vi) State any two situations, under which tacheometry is prefered.

(vii) List any four modern survey instruments.

(viii) Define degree of curve.

P.T.O.

Marks

b) **Attempt any TWO of the following:** **8**

(i) Differentiate between active system and passive system of remote sensing.

(ii) What are the checks applied in case of

1) closed traverse and

2) open traverse

(iii) Draw neat sketch of contour for the following:
Assume suitable contour values and show the same.

1) Pond

2) Ridge

3) Saddle

4) Hill

2. Attempt any FOUR of the following: **16**

a) Differentiate between contour interval and horizontal equivalent. (Minimum two points). Draw plan and section view to support your answer.

b) Define grade contour. Give the procedure to locate grade contour on contour map, with suitable sketch.

c) Calculate the area of figure in hectares, drawn to scale of 1 cm = 120 m, from following data - I.R.=2.695, F.R.=9.148. Zero of dial passed the fixed index mark twice in clockwise direction. Area corresponding to one revolution of the roller is 100 sq.cm. Anchor point was outside the figure.

d) Define tacheometry. State the principle of tacheometry with sketch.

e) State any four uses of digital theodolite.

f) Find the length and bearing of line AB, if the co-ordinates of A and B are as follows :

Station	Northing	Easting
A	1282.5	939.8
B	900.2	766.4

Marks

3. Attempt any FOUR of the following: **16**

a) What are different methods of contouring? Describe any one method along with a sketch. Also write the situation where it is suitable.

b) State the component parts of micro optic theodolite. How it is superior to a transit theodolite?

c) Give classification of curve and define

(i) transition curve and

(ii) reverse curve

d) State any four applications of remote sensing in civil engineering.

e) What is meant by zero circle? State the advantages of digital planimeter over polar planimeter.

f) Enlist the advantages and disadvantages of total station.

4. Attempt any FOUR of the following: **16**

a) Calculate the ordinates at 7.5 m intervals for a circular curve, given that the length of long chord is 80 m and radius of curve is 130 m. Use exact formula.

b) Define following terms and give any two components of each:

(i) GIS

(ii) GPS

c) Explain temporary adjustments of digital level.

d) The areas enclosed by the contours in a lake are as follows:

Contour (m)	250	255	260	265	270
Area (m^2)	2080	8500	16500	25200	33700

Calculate the volume of water between the contours 250 m and 270 m by

(i) Trapezoidal formula and

(ii) Prismoidal formula

e) What is the difference between a theodolite and a tacheometer. Give any two characteristics of tacheometer.

f) Give the main features of total station.

Marks

5. Attempt any TWO of the following: **16**

a) Calculate the corrected consecutive co-ordinates for the following observations of traverse.

Line	Length (m)	Point	Consecutive Coordinates	
			Latitude	Departure
AB	705	A	+ 655.19	– 260.29
BC	952.5	B	+ 127.07	+ 943.99
CD	645	C	– 628.47	+ 145.54
DA	844.5	D	– 151.48	– 830.80

b) A tacheometer was set up at station A and following readings were obtained on a staff held vertically.

Station	Staff Station	Vertical Angle	Hair Reading
A	B.M.	+ 7°30′	0.900, 1.175, 1.530
B	B	– 2°20′	1.125, 1.330, 1.445

The constants of instrument were 100 and 0.10. Find the horizontal distance AB and R.L. of B, if R.L. of B.M. is 500.00 m.

c) Enlist any eight components of transit theodolite and write their functions.

6. Attempt any TWO of the following: **16**

a) Two tangents intersect at a chainage of 1250 m. The angle of intersection is 145°. Calculate all the necessary data for setting out a curve of radius 250 m by deflection angle method. Take peg interval as 20 m and prepare setting out table.

b) Describe layout of small building by using total station.

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

Line	AB	BC	CD	DA
Length (m)	260	240	250	?
Bearing	341°	295°	147°	?

Determine length and bearing of line DA.