

17419

11819

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. a) **Attempt any SIX of the following:** **12**
- (i) Define contour interval and horizontal equivalent.
 - (ii) Draw contours of Valley and Ridge line.
 - (iii) State any four uses of transit theodolite.
 - (iv) Define the terms - Latitude and Departure.
 - (v) What is anallatic lens.
 - (vi) List any four modern surveying instruments.
 - (vii) Define compound curve and reverse curve.
 - (viii) Enlist type of curves used in road and railway alignment.
- b) **Attempt any TWO of the following:** **8**
- (i) State the methods of locating contours with merits and demerits of each.
 - (ii) Describe layout of building using total station.
 - (iii) Differentiate between active system and passive system of remote sensing.

P.T.O.

2. Attempt any FOUR of the following: 16

- a) Points 'P' and 'Q' are two ground points at a distance of 20m with their reduced level are 75.380 and 78.260m respectively interpolate the contours of 76, 77 and 78.
- b) Enlist uses of contour maps.
- c) Calculate the area of figure in hectares, drawn to scale of 1 cm = 120m, 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) State any four uses of total station.
- e) Define tacheometry. State the principle of tacheometry with sketch.
- f) Enlist the checks applied in case of closed traverse.

3. Attempt any FOUR of the following: 16

- a) State with sketch procedure for computing constants of planimeter.
- b) State the component parts of micro optic theodolite. How it is superior to a transit theodolite.
- c) Explain the procedure of measurement of magnetic bearing in theodolite.
- d) Differentiate between theodolite and tacheometer. Give any two characteristics of Tacheometer.
- e) Draw neat sketch of simple circular curve showing all elements.
- f) The interior angles of closed traverse ABCDE are as follows:
 $\angle A = 78^\circ 40' 15''$
 $\angle B = 104^\circ 45' 20''$
 $\angle C = 85^\circ 35' 40''$
 $\angle D = 150^\circ 40' 30''$
 $\angle E = 120^\circ 18' 15''$

The bearing of line AB is $220^\circ 25' 30''$. Calculate bearing of remaining sides.

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

- Explain with example, establishing grade contours.
- State the error that are eliminated by the method of repetition in the measurement of horizontal angle by a transit theodolite.
- Explain temporary adjustments of digital level.
- Explain the setting of curve by Rankine's deflection angle method.
- Explain the procedure for measuring vertical angle by using electronic theodolite.
- State the sources of error in theodolite.

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

- Following are the length of traverse and bearing of traverse.

Line	Length 'm'	Bearing
AB	260 m	30°
BC	325 m	140°
CD	185 m	210°

Find the length and bearing of line DA.

- A tacheometer fitted with anallatic lens was set up at station A and the following readings were obtained on vertically held staff.

Inst. Station	Staff station	Vertical Angle	Stadia Reading
A	BM	+8°	0.800, 1.120, 1.480
A	B	-4°	1.140, 1.235, 1.330

The constants (f/i) is 100, find distance AB and RL of station B as R.L of BM is 100.000 m.

- Differentiate between Prismoidal formula and Trapezoidal formula for computation of volume.
 - State the advantages and disadvantages of GPS.

6. 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 co-ordinates	
			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) Calculate the ordinates of 25m interval to set out a circular curve having a long chord 300m and versed sine of 10m.
- c) State the procedure of traversing by using total station.
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