

Total number of printed pages—4

53 (CE 301) SURV-I

2013

(December)

SURVEYING-I

Paper : CE-301

Full Marks : 100

Pass Marks : 30

Time : Three hours

**The figures in the margin indicate full marks
for the questions.**

Answer any five questions.

1. (a) Explain the procedure of Bessel's graphical solution for three-point problem. 10
- (b) Two points *A* and *B* are 1530m apart across a wide river. The following reciprocal levels are taken with one level. 10

Level at	Readings on (m)	
	<i>A</i>	<i>B</i>
<i>A</i>	2.165	3.810
<i>B</i>	0.910	2.355

The error in the collimation adjustments off the level is $-0.004m$ in $100m$. Calculate the true difference of level between *A* and *B* and the refraction.

Contd.

2. (a) Give the advantages and disadvantages of plane table surveying. 6
- (b) Explain *any two* uses of contour maps. 6
- (c) State what errors are eliminated by repetition method. How will you set out a horizontal angle by methods of repetition? 8
3. (a) In running fly levels from a bench mark of R.L. 183.215, the following readings were obtained. 10

B.S. 1.215 2.035 1.980 2.625

F.S. 0.965 3.830 0.980

From the last position of the instrument, five pegs at 20m intervals are to be set out on a uniform rising gradient of 1 in 40; the first peg is to have a R.L. of 181.580. Work out the staff readings required for setting the tops of the pegs in the given gradient.

- (b) What is contour? Explain the characteristics of contours. 10
4. (a) Which method is suitable for locating contours for a relatively small and flat ground? Explain the procedure. 6

- (b) What are the different methods of plane tabling? Explain *any two*. 8
- (c) What are the fundamental lines of a theodolite? Explain their desired relations. 6
5. (a) The following bearings were observed in running a closed traverse. 10

Line	F.B.	B.B.
AB	$71^{\circ}05'$	$250^{\circ}20'$
BC	$110^{\circ}20'$	$292^{\circ}35'$
CD	$161^{\circ}35'$	$341^{\circ}45'$
DE	$220^{\circ}50'$	$40^{\circ}05'$
EA	$300^{\circ}50'$	$121^{\circ}10'$

Determine the correct magnetic bearings of the lines.

- (b) Explain the procedure to measure horizontal angles by reiteration method. 5
- (c) Derive the expression for height and distance of an object by trigonometric levelling when instrument axes are at different levels. 5

6. Explain the following terms briefly : $10 \times 2 = 20$

- (a) Plain Surveying and Geodetic Surveying
- (b) Local attraction
- (c) Magnetic meridian
- (d) Azimuthal bearing
- (e) Reciprocal levelling
- (f) Terrestrial refraction
- (g) Transiting the telescope
- (h) Contour gradient
- (i) Orientation by trough compass
- (j) Line of collimation.