53(CE 301) SURV-I

2015

SURVEYING – 1

Paper : CE 301

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions*

1. *(a)* Name different types of plane table used commonly. Explain their uses. 6

(b) In levelling between two points A and B on opposite banks of a river, the level was set up near A, and the staff readings on A and B were 1.285 *m* and 2.860 *m* respectively. The level was then moved and set up near B and the respective readings on A and B were 0.860 and 2.220. Find the true difference of level between A and B. 6

(c) Explain *any four* uses of contour maps. 8

2. (a) To determine the elevation of the top of a flag-staff, the following observations were made : 6

Inst. Station	Reading on B.M.(*m*)	Angle of elevation	Remarks
A	1·266	10°48'	R.L. of
B	1·086	7°12'	B.M.=248.362*m*

(b) What is two-point problem ? How is it solved ? 10

(c) Discuss the various methods of orienting the plane table. 4

3. (a) Differentiate between contour interval and horizontal equivalent. Explain the characteristics of contours. 4+6=10

(b) Explain the following : 2×5=10

(i) Correction for curvature and refraction.

(ii) Advantages and disadvantages of plane table surveying.

4. (a) Differentiate between Repetition Method and Reiteration Method. 6

(b) Explain how the procedure of reciprocal levelling eliminates the effect of atmospheric refraction and earth's curvature as well as the effect of inadjustment of the line of collimation. 6

(c) Explain the different methods used for interpretation of contours. 8

5. (a) The following bearings were observed with a compass : 10

AB	74°0'	BA	255°0'
BC	91°0'	CB	270°0'
CD	164°0'	DC	342°0
DE	177°0'	ED	0°0'
EA	189°0'	AE	9°0'

Where do you suspect the local Attraction ? Find the correct bearings.

(b) Derive the expressions for height and distance of an object, when object and instrument section are in the same vertical plane and instrument axes at very different levels. 10

6. (a) In running fly-levels from a bench mark of R.L. 384.705, the following readings were obtained.

Backsight 3.215, 1.030, 1.295, 1.855
Foresight 1.225, 3.290, 2.085

From the last position of the instrument six pegs at 25 metres interval are to be set out on a uniformly falling gradient of 1 in 100, the first peg is to have B.L. of 384.500. Work out the staff readings required for setting the tops of the pegs on the given gradient. 10

(b) Explain the fundamental lines and their desired relations of theodolite. 6

(c) Briefly explain the factors on which the choice of proper contour interval depends. 4

7. (a) Discuss the importance of surveying in the field of civil engineering. 5

(b) Find the sag correction for a 30*m* steel tape under a pull of 8 *kg* in three equal spans of 10*m* each. weight of 1 cm^3 of steel = 7·86*g*. Area of cross-section of the tape = 0·10 cm^2. 5

(c) A luminous object on the top of a hill is visible just above the horizon at a certain station at the sea-level. The

distance of the top of the hill from the station is 40 *km*. Find the height of the hill, take radius of earth equal to 6370 *km*. 5

(d) Distinguish between Radiation and Intersection Method in plane table surveying. 5
