53 (CE 301) SURV-I

2014

SURVEYING-I

Paper : CE 301

Full Marks : 100

Time : Three hours

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

*Answer **any 5 (five)** questions.*

1. *(a)* Differentiate between Repetition method and Reiteration method. 6

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

Instrument 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*

Stations *A* & *B* and the top of the aerial pole are in the some vertical plane. Find the elevation of the top of the flag-staff, if the distance between *A* & *B* is 50*m*.

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

2. (a) 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

(b) Differentiate between contour interval and horizontal equivalent. Explain the characteristics of contours. 4+6

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

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

4. (a) 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

(b) Discuss the importance of surveying in the field of civil engineering. 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

5. (a) 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 $1cm^3$ of steel = 7·86*g*. Area of cross-section of the tape = $0 \cdot 10cm^2$. 5

(b) Distinguish between Radiation and Intersection method in plane table surveying. 5

(c) Explain the following : 2×5

(i) Correction for curvature and refraction

(ii) Advantages and disadvantages of plane table surveying.

6. (a) In levelling between two points A & B on opposite banks of a river, the level was set up near A, and the staff readings on A & B were $1{\cdot}285m$ and $2{\cdot}860m$ respectively. The level was then moved and set up near B and the respective readings on A & B were 0·860 and 2·220. Find the true difference of level between A & B. 6

(b) Explain the different methods used for interpolation of contours. 8

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

7. (a) In running fly-levels from a bench mark of R.L. 384·705, the following readings were obtained. 10

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 R.L. of 384·500. Work out the staff readings required for setting the tops of the pegs on the given gradient.

(b) Name different types of plane table used commonly. Explain their uses. 6

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