

Total Pages—6

(Set-R₁)

B.Tech - 4th
Engg. Surveying

Full Marks : 70

Time : 3 hours

Answer any six questions including Q. No. 1

The figures in the right-hand margin indicate marks

1. Answer the following questions : 2 × 10
- (a) Distinguish geodetic surveying from plane surveying.
 - (b) Write in brief about the methods used for locating ground features in chain triangulation.
 - (c) Enumerate the sources of errors in chain surveying.
 - (d) What is local attraction ? How can it be rectified in case of a compass traverse ?
 - (e) Explain in brief the principles followed in plane table survey.

(Turn Over)

(2)

- (f) Establish the relationship between radius and degree of a simple circular curve.
 - (g) Why is it necessary to take both 'face left' and 'face right' observations in theodolite?
 - (h) Show with neat sketch the characteristic contours of a over hanging cliff.
 - (i) How line of collimation is different from the height of the instrument in levelling?
 - (j) Why and where reciprocal levelling is required?
2. (a) A 30 m chain was tested before the commencement of work and found to be correct. Using the data plan of area of the field was drawn to a scale of 1 cm = 8 m in which area of a plot was measured as 65.4 sq. cm. But, later at the end of the survey and plotting the chain was found to be 0.18 m too long. Find the true area of the plot.

3

(3)

- (b) What is Hypotenusal allowance ? Find the hypotenusal allowance per chain of 20 m if the ground rises by 5.3 m per chain length. 3
- (c) Explain with a sketch the method of chaining past a tall building. (only one method). 4
3. (a) With the help of a neat sketch show the graduations in a Prismatic Compass. 2
- (b) The following bearings were taken in running a closed compass traverse : 8

LINE	F.B.	B.B.
AB	51°30'	230°00'
BC	174°40'	356°00'
CD	104°15'	284°55'
DE	165°15'	345°15'
EA	259°30'	79°00'

- (i) State which stations were affected by local attraction and by how much.

- (ii) Determine the corrected bearings and internal angles.
4. (a) Explain the method of orientation of plane table by back sighting. 3
- (b) State Three point problem in plane table surveying and describe it's solution by trial and error method stating Lehmann's rules followed in estimating the location of point sought. 7
5. (a) An observer standing on the deck of a ship just sees a light house. The top of the light-house is 56 m above the sea level and the height of the observer's eye is 9 m above the sea level. Work out the distance between the observer and the lighthouse. 3
- (b) The following consecutive staff readings were taken with a 4 m staff, the level having been moved forward after 2nd, 6th and 9th readings :
- 0.585, 2.955, 1.855, 1.265, 2.925, 0.35, 2.35, 2.855, 1.655, 2.685, 2.435

(5)

The RL of the first point is 101.65 m. Enter the readings in level book form and reduce the levels. Apply usual checks. Also find the difference of RL between first and last points.

7

6. (a) Explain the characteristics of contour lines with the help of sketches.

5

(b) Discuss in brief with the help of sketches about any three uses of contour maps in civil engg.

5

7. (a) Describe the method of repetition for measurement of horizontal angle using theodolite.

4

(b) Tabulate the necessary data for setting out circular curve with the following data :

6

Angle in intersection = 144°

Chainage of point of intersection = 1390 m

Radius of the curve = 300 m

The curve is to be set out by offsets from chords produced with pegs at every 20 m of chainage.

(6)

8. Write short notes on any *four* : $2\frac{1}{2} \times 4$

(i) Reciprocal Ranging

(ii) Box-sextant

(iii) Pantagraph

(iv) Principles of surveying

(v) Spire test of theodolite

(vi) Well conditioned triangle.