

B.E. (Civil Engineering) Fourth Semester (C.B.S.)
Surveying - I Paper – IV

P. Pages : 3

Time : Three Hours



TKN/KS/16/7354

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No.12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) Define surveying. Describe classification of surveying. 5
- b) The following bearings were taken while conducting a closed traverse with prismatic compass. Find out which stations are subjected to local attraction and determine the corrected bearing. 8

LINE	F.B.	B.B
PQ	292° 15'	11° 45'
QR	221° 45'	41° 45'
RS	90° 05'	270° 00'
ST	80° 35'	261° 40'
TP	37° 00'	216° 30'

OR

2. a) Describe the construction of optical square and explain how to use it in the field. 6
- b) A and B are two points 200m apart along one bank of river flowing from east to west. The bearings of a tower on the other bank as observed from A and B are 40° and 310° respectively. Find the width of river. 7
3. a) The following consecutive readings were taken with the help of a level and 4m leveling staff at common interval of 30m. 8
1.904, 2.650, 3.905, 4.025, 1.965, 1.705, 1.595, 1.265, 2.545, 2.005, 3.145.
The instrument was shifted after the fourth and seventh reading. The first reading was taken on the B.M. of reduce level 101.000 m. Calculate R.L. of other points in a level page and apply the arithmetical check.
- b) Show that reciprocal leveling eliminates the effect of the atmospheric refraction and curvature of earth as well as the effect of inadjustment of line of collimation. 5

OR

4. a) What are the temporary adjustment of dumpy level? Explain how to carry it. 6
- b) The following notes refer to reciprocal levels:- 7

Instrument at	Staff Reading at		Remark
	A	B	
A	1.050	1.650	Distance AB = 1200m. RL of A = 240.500m
B	0.950	1.560	

Find.

- i) True RL of point B
 - ii) Combined correction for Curvature and Refraction.
 - iii) Error in line of collimation.
5. a) A level was tested by the two-peg method and following results were observed. 7

Instrument at	Staff Reading at		Remark
	A	B	
	1.150	1.795	Distance AB = 100m.
C	1.150	1.795	C is exactly mid-way between A and B
D	1.538	1.933	D lies on BA produced and 20m behind pt. 'A'

Calculate the staff readings on A and B to give a horizontal line of sight.

- b) List out the various methods of contouring and explain any one method in detail with neat sketch. 6
- OR**
6. a) Derive the expression to find the distance and elevation of object when the base of object is inaccessible. Consider instrument and object lies in the same vertical plane. 6
- b) A theodolite was set up at a distance of 300 m from a tower, and the angle of elevation to its top was $10^{\circ} 50'$. The staff reading on B.M. of reduced level 80.20 m with the telescope horizontal was 0.955. Find the R.L. of the top of tower. 7
7. a) What are the permanent adjustments of theodolite? Explain any one adjustment in detail. 6
- b) Following notes refer to theodolite surveying. 8

Line	Length (m)	Bearing
AB	686	$352^{\circ}24'$
BC	1824	$24^{\circ}36'$
CD	1053	$147^{\circ}30'$

Calculate the distance between a point E on AB, 28m from A and a point F on CD 650m from C.

OR

8. a) Find the area of closed traverse having the following data, by the co-ordinate method. 7

Side	Latitude (m)	Departure (m)
AB	+225.50	+120.50
BC	-245.00	+210.00
CD	-150.50	-110.50
DA	+170.00	-220.00

- b) List out the various methods of measurement of horizontal angle by using theodolite and explain any one method in detail. 7

9. a) Define orientation of plane table and explain various methods of orientation. 6

- b) A road embankment is 9 m wide and 300 m in length at the formation level with a side slope of 1.5:1. The embankment has a rising gradient of 1 in 100. The ground level at 50m interval are as follows: 7

Distance (m)	0	50	100	150	200	250	300
R.L. (m)	154.0	155.0	156.0	157.0	158.0	159.0	160.0

The formation level of zero chainage is 157.00 m. Calculate the volume of earth work.

OR

10. a) Explain the two point problem in plane table surveying. 6

- b) The width of formation level of a certain cutting is 10 m and the side slopes are 1:1. The surface of the ground has a uniform side slope of 1 in 5. If the depth of cutting at the center lines of three sections 50 m apart is 3m, 4m and 5m respectively, determine the volume of earth work involved in this length of cutting. 7

11. a) Enlist the various methods of locating soundings. Explain any one method in detail. 7

- b) What are the equipments required for sounding? Explain the use of each equipment. 7

OR

12. Write short notes on **any three**. 14

- i) Transferring the level underground.
- ii) E.D.M.
- iii) G.P.S
- iv) Uses of Hydrographic survey.
