B.E. (Civil Engineering) Fourth Semester (C.B.S.)

Surveying - I

P. Pages : 3 **NIR/KW/18/3351**

Time : Three Hours * 1 2 9 7 * 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. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain the principles of surveying. **5**

b) The following are the observed Bearing of the line of the Traverse ABCDEA with the compass in a place were local attraction was suspected. **8**

Line	F.B.	B.B.
AB	191º41'	13º0'
BC	39º30'	222º30'
CD	22º15'	200º30'
DE	242º45'	52º45'
EA	330º15'	147º45'

Find the correct Bearing of line.

OR

2. a) Explain with Diagram various parts of prismatic compass and their uses. **7**

b) A steel Tape was exactly 30m long at 20ºC when supported throughout its length under a pull of 10 kg. A line was measured with this Tape under a pull of 15kg at a mean Temperature of 32ºC and found to be 780m long. The cross-sectional area of Tape = 0.03cm^2, and its total weight = 0.693kg α for steel $= 11\times10^{-6}\,\text{per}^\circ\text{C}$ and E for steel $= 2.1\times10^{6}\,\text{kg/cm}$. Compute the True length of line when the Tape was supported During measurement at every (i) 15m (ii) 30m. **6**

3. a) What is reciprocal levelling and why it is employed? What error will be eliminated By this? **5**

b) The following are the consecutive staff reading observed with a 4m levelling staff at a common interval of 30m
0.525m, on A, 0.936, 1.953, 2.846, 3.644, 0.962, 2.534, 3.844, 0.956, 1.579 and 3.016m on B. The elevation of point A is 120m. Make a level Book and apply usual-check. Determine the Gradient of Line AB. **8**

OR

4. a) What are the Temporary adjustment of Dumpy level? And How are they carry out. **6**

b) The following Notes refers to reciprocal levels, **7**

Instrument at	Staff	Reading at	Remark
	A	B	
A	1.155	2.595	RL of A = 525.0
B	0.985	2.415	Distance AB = 500m

Find :-

i) True RL of point B

ii) Combined correction for curvature and Refraction

iii) Error in line of Collimation.

5. a) Explain with neat sketches the characteristic of contours. **6**

b) In conducting the Two-peg test of level, the same was setup at a station 'C' exactly midway between pegs A and B 90m apart. The staff reading on pegs A and B was found to be 1.325m and 1.565m. The instrument was then moved and set up at point 'D' Beyond peg A in line BA produced at a Distance 10m from A. The staff readings on A and B were 1.110m and 1.375m. Calculate the staff reading on pegs A and B to give a Horizontal line of sight. **7**

OR

6. a) What are the fundamental lines of level? How to check and adjust for the Desired relation between them? **6**

b) A Theodolite was set up at a Distance of 300m from a Tower, and the Angle of elevation to its Top was 10º50'. The staff reading on B.M. of R.L. 80.20m with the Telescope Horizontal was 0.955. Find the R.L. of Top of Tower. **7**

7. a) An incomplete Traverse table is obtain as follow. **8**

Line	Length(m)	Bearing
AB	100.50	?
BC	80.5	140º30'
CD	60.0	220º30'
DA	?	310º15'

Calculate the length of DA and Bearing of AB.

b) What are the permanent adjustment of Theodolite? Explain any one adjustment in Detail. **6**

OR

8. a) Find the area of closed Traverse having the following Data, By the Co-ordinate method. **7**

Line	Latitude	Departure
AB	225.5	120.5
BC	–245.0	210.0
CD	–150.5	–110.5
DA	170	–220

b) List out the various uses of Theodolite and explain measurement of vertical Angle. **7**

9. a) Define principle of plane Table surveying. Explain Traversing method of plane Table surveying. **6**

b) A railway embankment of formation width of 8m and side slope 2:1 is to constructed. The ground level along the centre line is as follows: **7**

Chainage	0	50	100	150	200	250
G.L (m)	115.75	114.35	116.80	115.20	118.50	118.25

The embankment has a rising gradient of 1 in 100, and the formation level at zero chainage is 115.00.
Assume the ground is level across the centre line, compute the volume of earthwork.

OR

10. a) Explain the Three point problem in plane Table surveying. **6**

b) The Ground level along the centre line of a road is given below: **7**

Chainage	0	50	100	150	200	250	300
G.L (m)	117.50	116.25	115.95	116.65	117.20	117.85	115.75

It is proposed that the formation level of RL 115.00
Should be kept constant of starting from the chainage 'zero'. The Formation width of the road is 8m and the side slope 1:1. The Ground level Transverse to the centre line.

11. a) What is sounding? Explain any two methods of sounding. **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) E.D.M.

ii) GPS.

iii) Transferring the level underground.

iv) Uses of Hydrographic survey.

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