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

Surveying - I Paper - IV

P. Pages : 2 **KNT/KW/16/7266**

Time : Three Hours * 0 1 3 6 * 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.
10. Use of non programmable calculator is permitted.

1. a) Describe with neat sketch, the construction and use of an open cross staff. **7**

b) Explain briefly how plane surveying differs from geodetic surveying. **6**

2. a) Write about temporary adjustment of prismatic compass. **6**

b) The following are the observed bearings of the lines of a traverse ABCDEA with a compass in a place where local attraction was suspected. **7**

Line	FB	BB
AB	191º 45'	13º 0'
BC	39º 30'	222º 30'
CD	22º 15'	200º 30'
DE	242º 45'	62º 45'
EA	330º 15'	147º 45'

Find the correct bearings of the lines.

3. a) What are the temporary adjustments of dumpy level? How it is done? **7**

b) The following successive readings were taken with a dumpy level along a chain at common intervals of 20 m. The first readings was taken on a chainage 140 m. The RL of the second change point was 107.215 m the instrument was shifted after the third & seventh readings. Calculate the RLs of all the points. **7**

3.150, 2.245, 1.125, 3.860, 2.125, 0.760, 2.235, 0.470, 1.935, 3.255 and 3.890 m.

4. a) Explain with neat sketches of characteristics of contours. **7**

b) The following notes refer to the reciprocal levels taken with one level: **7**

Instrument station	Staff reading on		Remarks
	A	B	Distance between
A	1.029	1.634	A&B = 800 m
B	0.943	1.542	RL of A = 421.543 m

Find
i) True RL of B.
ii) Combined correction for curvature and Refraction
iii) The error in collimation adjustment of the instrument.

5. a) Derive the equation to determine RL of top of the elevated object as the base of the object is not accessible and the nearer theodolite is higher than the far theodolite. **6**

b) A levelling Instrument was set up exactly mid-way between two pegs A & B, 100 m apart. The staff readings on A & B were 1.875 and 1.790 respectively. The instrument was then set up at a distance of 10 m from A an the line AB. The respective staff readings were 1.630 & 1.560. Calculate the correct staff reading on A & B when the line of collimation is exactly horizontal. **7**

6. a) Explain collimation system and rise and fall system. **6**

b) When the bubble is at the centre, the reading on the staff, 100 m from the level is 2.550 m. The bubble is then deviated by five divisions and the staff reading is 2.500 m. If the length of one division of the bubble is 2 mm, calculate radius of curvature of the bubble tube and angular vane of one division of the bubble. **7**

7. a) Describe the process of measuring the magnetic bearing of a line by theodolite. **7**

b) The record of a closed traverse is given below. **7**

Line	Length	Bearing
AB	100.5	N 30º 30ºE
BC	?	S 45º 0' E
CD	75.0	S 40º 30' W
DE	50.5	S 60º 0' W
EA	?	N 40º 15' W

Calculate the lengths of BC & EA.

8. a) Explain the repetition method of measuring horizontal angle. **7**

b) Discuss the Bowditch's rule for balancing the traverse. **7**

9. a) Explain radiation method of plane tabling. **6**

b) An embankment of width 10 m and side slopes 1.5: 1 is required to be made an a ground which is level in a direction transverse to the centre line. The central heights at 40 m. intervals are as follows: 0.90, 1.25, 2.15, 2.50, 1.85, 1.35 and 0.85 calculate the volume of earthwork according to prismoidal formula. **7**

10. a) What is orientation? What are the methods of orientation? Describe any one method with a sketch. **6**

b) The following offsets are taken from a survey line to a curved boundary line : **7**

Dist. (m)	0	5	10	15	20	30	40	60	80
Offset (m)	2.5	3.80	4.60	5.20	6.10	4.70	5.80	3.90	2.20

Find the area between the survey line, the boundary line, and first and the last offsets by

i) Trapezoidal rule

ii) Simpson's rule

11. a) What is sounding? Explain any two methods of sounding. **6**

b) Write about sub surface float method of measurement of velocity of flow. **7**

12. a) Explain the procedure of transferring the levels underground. **6**

b) Write a short note on GPS. **7**

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