

GEO INFORMATICS

SECOND SEMESTER – (REGULATION 2012)

GI 8202 Plane Surveying

Time: 3 hrs

Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. List the methods of Ranging
2. The length of line measured with a 30 metres chain was found to be 250 metres calculate the true length of the line if the chain was 4 cm too long.
3. Differentiate between Declination and Dip
4. Define Resection in Plane Table Surveying
5. How would you measure a horizontal angle by repetition? What are its advantage?
6. Write the advantages of analytic lens in an external focusing telescope used in tachometry.
7. How would you conduct reconnaissance of a route?
8. Where will you provide a vertical curve?
9. Determine the discharge of a river from the following data. Area of cross-section 500m², Wetted perimeter = 220 m, Slope = 1 in 200 Manning's N = 0.030.
10. Define (i) Shaft (ii) Adit

Part – B (5 x 16 = 80 Marks)

11. How would you overcome the chaining problem if there are obstacles on the chain line?
(16 Marks)
12. (a) Given below are the bearings of the lines of a closed traverse. Adjust the bearing for local attraction
(16 Marks)

Line	FB	BB
AB	68°	247°
BC	55°	231°
CD	120°	304°
DE	180°	360°
EF	263°	87°
FL	311°	127°
GH	244°	66°
HA	301°	120°

B.E/B.Tech End semester Examination May 2013
Branch Geoinformatics
Semester VI
Subject: GI 9352 Survey Adjustment

Duration 3 hours

Max marks 100

Answer all questions
Part A (10x2=20marks)

1. Explain confidence limits in survey data analysis.
2. How will you reject survey data using statistical analysis?
3. Explain the advantages of Linearization
4. What do you mean by Error propagation
5. Explain Adjustment of Indirect observation
6. Explain Adjustment of observation only
7. Explain Normal distribution
8. How will you determine precision and accuracy of an observation
9. Explain the reliability of measurements.
10. Explain the use of cofactor matrices

Part B (16x5=80 marks)

11 (i) Explain the error propagation in GIS based modeling.

(ii) In the course of the precise leveling of a certain area the following results were obtained. Determine the most probable level of B, C and D above A.

<i>Level line</i>	<i>Level difference</i>	<i>Weight</i>
A to B	Rise 4.727 m	1
B to C	Rise 1.580 m	1
C to D	Rise 3.540 m	3
D to A	Fall 9.846 m	1
B to D	Rise 5.125 m	2
A to C	Rise 6.315 m	2

12.(a) In quadrilateral ABCD angles were measured as follows

BAC = 55°02'15"	DCA = 42°16'42"
CAD = 59°29'09"	ACD = 34°48'42"
CBD = 54°00'58"	ADB = 29°20'36"
DBA = 36°08'22"	BDC = 48°53'35"

Adjust the angles using the method of least squares, assuming the equal weights to apply.

(or)

12(b) A straight-line $y=ax + b$ must be fitted through three points. The following data are given

Point	X (cm)	Y (cm)	σ_y^2
1	2.00	3.20	0.10
2	4.00	4.00	0.08
3	6.00	5.00	0.08

Assume X coordinates are error free-constants. All measured coordinates are assumed to be uncorrelated. Find least squares estimate of the two parameter a and b.

13. (a) Six independent determination of the elevation of a point are made. These values and their corresponding weights are shown below.

Elevation (M)	Weight
214.151	2
214.213	1
214.114	2
214.167	3
214.130	5
214.189	3

Compute the weighted mean of the six elevations and evaluate the standard deviation of this weighted mean if a weight of 2 corresponds to a standard deviation of 0.030 m.

(or)

13(b) The bearing and length of a traverse line have been observed to be $38^{\circ} 45' 20''$ and 168.08 m respectively. Assume that standard deviation of 20 seconds and 50 mm apply to the observations. Calculate the standard deviation and covariance of the coordinate difference of the line.

14 (a) Suppose the angles in a triangle ABC were each measured by the same observer using the same instruments, but the number of repetitions for each angle varied. The results were $A = 45^{\circ} 15' 25''$, $n = 4$, $B = 83^{\circ} 37' 22''$, $n = 8$, and $C = 51^{\circ} 07' 39''$, $n = 6$. Adjust the angles.

(or)

b) While measuring angles at a station, the horizon was closed. The following measurements and their standard deviations were obtained.

No.	Angle	S
a_1	$134^{\circ} 38' 56''$	6.7''
a_2	$83^{\circ} 17' 35''$	9.9''
a_3	$142^{\circ} 03' 14''$	4.3''

What are the most probable values for the observation above?

15. (a)(i) Explain the GPS network adjustment. (4)

(ii) The following angular observations were made at a station.

A =	$52^{\circ} 04' 31''$,	weight 1
B =	$44^{\circ} 23' 15''$,	weight 1
A + B =	$96^{\circ} 27' 44''$,	weight 2
C =	$45^{\circ} 14' 30''$,	weight 2
B + C =	$89^{\circ} 37' 48''$,	weight 3

Determine the best values of A, B and C to the nearest second. (12)

(or)

(b) (i) Explain t and chi-square distribution. (8)

(ii) Explain bivariate normal distribution and error ellipses. (8)