



Reg. No. :

Name :

Third Semester B.Tech. Degree Examination, April/May 2012
(2008 Scheme)
Branch : CIVIL
08-305 : Surveying – I

Time : 3 Hours

Max. Marks : 100

Answer **all** questions under Part – **A** and '**one full** question' from **each** of the Modules under Part – **B**. Questions from Part – **A** carry **5** marks **each** and those under Part – **B** carry **20** marks **each**.

PART – A

- I. 1) Define the following terms :
True bearing, Declination, Secular variation Irregular variation, Isogonic lines.
- 2) What is local attraction ? How is it detected and eliminated ?
- 3) What is orientation ? What are the methods of orientation ? Describe the methods with sketches. What type of orientation would you prefer and why ?
- 4) Explain fully three process of reciprocal levelling and state its advantages.
- 5) What is a contour ? How is it plotted ?
- 6) What do you mean by mass diagram ? Explain the characteristics.
- 7) What are face left and face right observations ? Why is it necessary to take both the observations ? Why both the verniers are read ?
- 8) Explain the principle of movable hair method of tacheometry. State the advantages of movable hair method. (8×5=40 Marks)

PART – B
Module – 1

- II. a) What are three sources of errors in compass survey and what precautions are taken to eliminate them ? 8
- b) A line was shown to a magnetic bearing of $35^{\circ}15'$ in an old map, when the declination was $13^{\circ}45'$ E. To what bearing should it be set now if the present magnetic declination is $4^{\circ}15'$ W. 4



- c) From a point C, it is required to set out a line CD parallel to a given line AB, such that ABD is a right angle. C and D are not visible from A and B, the traversing is performed as follows.

Line	Length (m)	Bearing
BA	—	360°
BE	51.7	290° 57'
EF	61.4	352° 6'
FC	39.3	263° 57'

Compute the required length and bearing of CD.

8

OR

- III. a) Distinguish between resection and intersection methods as applied to plane table surveying. 4
- b) What are the different sources of errors in plane tabling ? How they are eliminated ? 6
- c) Define three point problem and how it is solved by Bessel's method and Triangle of error method. 10

Module – II

- IV. a) Discuss the effects of curvature and refraction in levelling. Derive expressions due to each and combined correction. Why are these effects ignored in ordinary levelling ? 6
- b) The following notes refer to reciprocal levels taken with one level.

Investment Wear	Staff Reading on		Remark
	P	Q	
P	1.824	2.748	Distance PQ = 1010 m
Q	0.928	1.606	R.L. of P = 126.386 m

Find :

- a) The true R.L. of Q.
- b) the combined correction for curvature and refraction and
- c) the angular error in the collimation adjustment.

6



- c) The following consecutive readings were taken with a level and 4 m levelling staff on a continuously sloping ground at common intervals of 30 m. 0.905 (on A), 1.745, 2.345, 3.125, 3.725, 0.545, 1.390, 2.055, 2.955, 3.455, 0.595, 1.015, 1.850, 2.655 and 2.945 (on B).

The RL of A was 95.500. Calculate the RLs of different points and find the gradient of the line AB.

8

OR

- V. a) Describe briefly the considerations for selecting a proper contour interval. 5
b) Derive expressions, with the help of usual notations, for the side widths and areas of a
i) level section and
ii) a two level section. 7
c) The levels were taken at every 30 m along the centre of a proposed road. They are as follows :

Chainage in metres	Reduced level (m)
0	525.55
30	528.30
60	531.85
90	531.50
120	531.55

A cutting is to be made for a line of uniform gradient passing through the first and last points.

Find :

- a) gradient of the line
b) the volume of the cutting, given that the width of the cutting at the formation level is 8 m, the side slopes 1 to 1 and the surface of the ground has a uniform slope of 1 in 8.

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Module – III

- VI. a) Write short note on tangential system of tacheometry. 5
b) Derive an expression for the horizontal distance D and difference in elevation V with staff vertical and the line of sight is inclined. 5



- c) To determine the gradient between two points A and B, a tacheometer was set up at another station C and the following observations were made, keeping the staff vertical.

Staff At	Vertical Angle	Stadia reading
A	$4^{\circ}20'0''$	1.300, 1.610, 1.920
B	$0^{\circ}10'40''$	1.100, 1.410, 1.720

The horizontal angle ACB is $35^{\circ}20'$. Determine the average gradient between A and B, Given multiplying constant 100 and additive constant '0'.

10

OR

- VII. a) What are the different errors in theodolite work ? How are they eliminated ? Explain in detail.
- b) The following observations were made on three shore stations A, B and C from a boat station P, stations B and P being on the opposite sides of AC; $AB = 1130$ m, $BC = 1375$ m, and $CA = 1900$ m from the boat P, angles APB, and BPC are measured with a nautical sextant and found to be $42^{\circ}30'$ and $54^{\circ}15'$ respectively. Find the position of the boat from shore stations if B and P are either side of AC.

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