B.E. Mining Engineering Fourth Semester

MN402 - Mine Surveying-I

P. Pages : 3 **GUG/W/18/1585**

Time : Three Hours * 1 2 4 9 * Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answers wherever necessary with the help of neat sketches.
4. Weightage to the question indicated to its right.

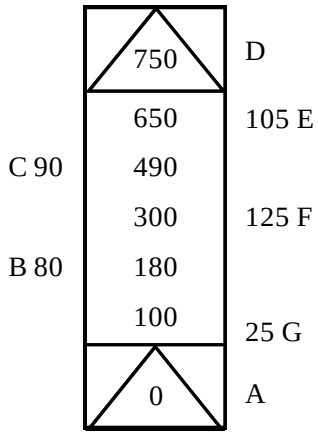
1. a) B and C are two points on the opposite banks of a river along a chain line ABC which crosses the river at right angles to the bank. From point P which is 45.72 m from B along the bank, the bearing of A is 215º30' and the bearing of C is 305º 30'. If the length AB is 60.96 m, find the width of river. **6**

b) In running a closed traverse ABCDE, the following bearings were observed with a compass where local attraction was suspected. At what stations do you suspect local attraction? Determine the correct fore and back bearings. Also find out included angles. **10**

Line	Fore bearing	Back bearing
AB	80º	260º
BC	90º	269º
CD	120º	301º
DE	200º	18º
EA	318º	140º

OR

2. a) Plot the following cross staff survey of a field and calculate its area. All distances are given in meters. **6**



b) The following bearings were taken in running a compass traverse. At what stations do you suspect local attraction? Find the corrected bearings. **10**

Line	Observed bearings	Line	Observed bearings
AB	N 46º 10' E	CD	S 10º 30' E
BA	S 46º 10' W	DC	N 8º 50' W
BC	S 60º 40' E	DA	N 79º 40' W
CB	N 61º 20' W	AD	S 80º 40' E

3. a) The following consecutive readings were taken with a dumpy level 0.795, 1.655, 2.890, 3.015, 0.655, 0.625, 0.955, 0.255, 1.635, 0.860, 2.375 The instrument was shifted after the fourth and eighth readings. The first reading was taken on a bench mark whose R.L. is 550.605m. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the stations by the rise and fall method and apply arithmetical checks. **10**

b) In levelling across a river, two stations A & B were fixed on opposite banks. The following readings were obtained with reciprocal levelling. **6**

Position of level	Staff Reading at	
	A	B
Level at A	1.871	1.469
Level at B	1.664	0.706

If R. L. of A is 50.865 m, find the R. L. of station B.

OR

4. a) Explain "curvature and Refraction" in Levelling **6**

b) A, B, C and D are four points plotted at 2 cm apart and their ground reduced levels are 57.5, 63.2, 68.2 and 59.2 respectively. It is required to draw contours at 2m vertical interval locate the positions of contour from 58m to 68m at 2m interval by arithmetical calculation. **10**

5. a) Calculate latitudes, departures and closing error for the following traverse. **10**

Line	Length (m)	Whole circle bearing
AB	89.31	45º 10'
BC	219.76	72º 05'
CD	151.18	161º 52'
DE	159.10	228º 43'
EA	232.26	300º 42'

b) A traverse is run from A to G and the deflection angles are as follows. **6**
At station B, 32º 16' L, C 18º 34' R, D 22º 12' L, E 42º 24', R, F 52º 42' R compute the bearings of the remaining sides of the traverse given that the forward bearing of the AB is 110º 6'.

OR

6. a) The following bearings were observed in a compass traverse. **6**

Line	Bearing	Line	Bearing
AB	N 52º 45' E	DE	N 46º 45' E
BC	N 34º 30' E	EF	S 82º 0' E
CD	S 85º 15' E		

Calculate the deflection angles.

b) The lengths and bearings of a traverse ABCD are as follows. **10**

Line	Length (m)	Bearings
AB	250.5	30º 15'
BC	310.4	145º 30'
CD	190.2	222º 15'

Calculate the length & bearing of the line DA.

7. a) A tachometer was set up at an intermediate station C of the line AB and following readings were obtained. **8**

Staff Station	Vertical Angle	Staff Readings
A	-6º 20'	0.445, 1.675, 2.905
B	+ 4º 20'	0.950, 1.880, 2.810

The instrument was fitted with an Anallactic lens and the constant was 100. Find the gradient of the line joining station A and B.

b) Two straights intersects at a chainage of 2056.44 m and the angle of intersection is 120º. If the radius of the simple curve to be introduced is 600 m, find the following. **8**

i) Tangent distances.
ii) Chainage of the point of commencement.
iii) Chainage of the point of tangency.
iv) Length of long chord.

OR

8. a) A tachometer is placed at a station A and readings on a staff held upon a B. M. of R. L.= 100.00 and a station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 respectively. The angle of depression of the telescope in the first case is -6º 19' and in the second case -7º 42' Find the horizontal distance from A to B and the R. L. of the station B. **8**

b) Derive an expression for setting out simple circular curve by offsets or ordinates from the long chord. **8**

9. a) State different method of plane table surveying and explain Radiation method with neat sketch. **8**

b) Explain the following astronomical terms. **8**

i) terrestrial equator ii) meridian
iii) Latitude iv) Longitude

OR

10. a) Describe various Errors in plane tabling. **8**

b) Define following terms. **8**

i) Ecliptic ii) Vernal Equinox
iii) Vertical Circle iv) Declination

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