

CVL 111 Elements of Surveying

Minor 2 Examination:

Total Marks 32

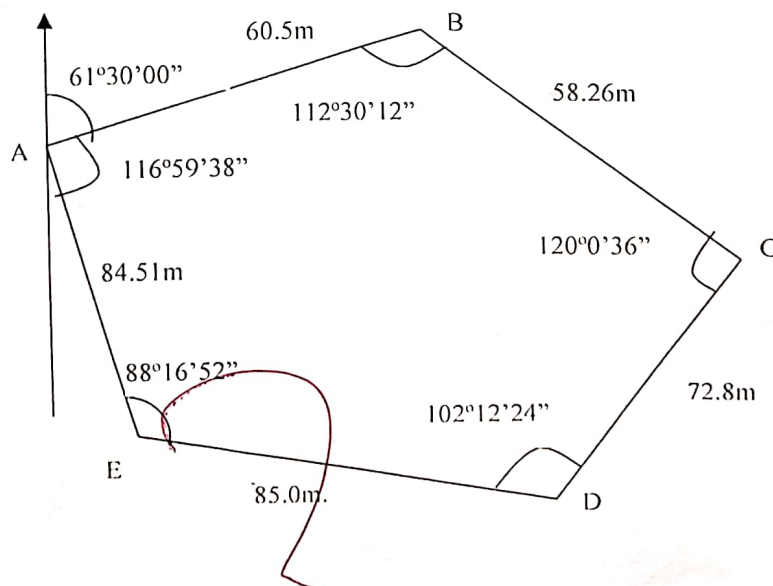
Time: 1 Hr 00 Mins

Please do not ask any doubt. Any missing data / info may suitably be assumed and highlighted in the answer book. If there is any fault with any question, you may mention that in your answer script. That shall be considered while evaluating the answer scripts.

Provide clear sketches where ever it is possible. You should not keep your mobile / cell phone with you during the examination

EXCHANGE OF CLACULATOR / ANY MATERIAL IS NOT ALLOWED

1. Two points A and B are clearly visible; but not accessible from the location where you are carrying out surveying. Describe, with sketches, the procedure for estimating the length of AB using a plain table and its accessories (alidade, spirit level, magnetic compass, U-frame and a measuring tape). Which method you will follow to solve this problem? **(6 marks)**
2. A simple circular curve is to be set on the ground by the Tacheometric method. Radius of the curve is 180 m and the total deflection angle (Δ) 30° . Calculate the lengths of back tangent, forward tangent, long chord and the length of the curve. Calculate the other parameters necessary for setting the curve and show the details on a sketch. The Tacheometric multiplication and addition constants are 100.20 and 0.15 respectively. **(8 marks)**
3. Estimate the area within the closed traverse ABCDEA using the Independent Coordinate method. The field observations of the traverse are given in a **rough sketch** below. It is only a rough sketch and not to any scale. Traverse closing correction not required if the error is only a little. **(8 marks)**



To estimate the area (horizontal) of PQR and the level difference of the points P and R with respect to Q.

Instrument station 'O' was outside and away from the triangle PQR. Face right Readings not taken, hence not available.

4. P, Q and R are three points on the ground at different elevations. A tacheometric theodolite was used to determine the horizontal area enclosed by the three points. The tacheometer was kept at O that was outside and away from the triangle PQR. At P and R, there were ranging rods (on which 1.5m distance was marked) fixed. At Q, a leveling staff was fixed. The readings taken are given in table below. The multiplication constant and addition constant of the tacheometer = 100.01 and 0.010 respectively. Estimate the horizontal area enclosed by the points P, Q and R. Also, estimate the level difference of the points P and R with respect to Q. **(10 Marks)**

Theodolite		FACE LEFT READINGS – Right Swing									
at	to	A	B	Mean	Included Angles	Stadia Readings	C	D	Mean		
O	P (Ranging Rod)	0° 0' 00"	0' 00"				+1° 5' 40" -0° 55' 00"	+1° 5' 30" -0° 54' 30"	+1° 5' 35" 1/2 -0° 54' 45" 1/2		
	Q (leveling staff)	15° 56' 40"	57' 00"	18° 56' 50"	15° 56' 50"	1.105m 0.435m	+1° 16' 20"	+1° 17' 00"	+1° 16' 40" 1/2		
	Q (actual point)						-1° 24' 20"	-1° 24' 40"	-1° 24' 30" 1/2		
O	R (Ranging Rod)	34° 45' 00"	44' 40"	34° 44' 50"	18° 48'		+2° 10' 20" -1° 16' 40"	+2° 10' 30" -1° 16' 40"	+2° 10' 25" 1/2 -1° 16' 40" 1/2		
	R (actual point)						-1° 50' 40"	-1° 51' 00"	-1° 50' 50" 1/2		
	P (actual point)	360° 0' 00"	0' 00"				-2° 30' 00"	-2° 30' 20"	-2° 30' 10" 1/2		