

ASSIGNMENT.NAME:- HAMAD-UR-RAHMANID:- 7669SUBJECT :- ADVANCE ENGINEERING  
SURVEYING (CE-223)TEACHER:- ENGR. ABDUL FARHANSEMESTER:- SENIOR.SECTION:- " B " .

ASSIGNMENTADVANCE ENGINEERINGSURVEYING (CE-223)

Q1) A):- Given Data:-

ID:- 7669

Tangent meet At Chainage = 7669ft

Deflection Angle =  $14^{\circ} 13' 23''$

Degree of curve =  $5^{\circ}$

Solution:-

$$D = 5^{\circ}$$

$$R = \frac{5729.58}{D}$$

$$R = \frac{5729.58}{5}$$

R = 1145.91ft



Tangent Length:-

$$= BT_1 = BT_2$$

$$R \tan\left(\frac{\phi}{2}\right)$$

$$BT_1 = BT_2 = 1145.91 \times \tan\left(\frac{14^\circ 13' 23''}{2}\right)$$

$$BT_1 = BT_2 = 142.966t$$

Length of Curve:-

$$L = \frac{\pi R \phi}{180}, \quad L = \frac{3.14 \times 1145.91 \times 14^\circ 13' 23''}{180}$$

$$L = 284.456t$$

Chainage of Intersection Point:-

$$= 7669.6t - 142.96 (T \cdot L)$$

$$\rightarrow \text{Chainage of } T_1 = 7526.046t + 284.45 \text{ (Length of Curve)}$$

$$\rightarrow \text{Chainage of } T_2 = 7810.496t$$

Length of Chord :- (I).

$$= 2R \sin(\phi/2)$$

$$= 2 \times 1195.91 \times \sin\left(\frac{14^\circ 13' 23''}{2}\right)$$

$$= 283.726t$$

Mid Ordinate:-

$$= R(1 - \cos(\phi/2))$$

$$= 1195.91 \left(1 - \cos\left(\frac{14^\circ 13' 23''}{2}\right)\right)$$

$$= 8.816t$$

External Distance:-  $= R(\sec(\phi/2) - 1)$

$$= 1195.91 \left(\sec\left(\frac{14^\circ 13' 23''}{2}\right) - 1\right)$$

$$= 8.886t$$

Q1) b):- Given Data :-

ID:- 7669

Offset No.	Offset	Simpson Multiplier	Product
1	7.669	1	7.669
2	10.669	4	42.676
3	11.669	2	23.33
4	5.669	4	22.676
5	3.669	2	7.338
6	4.669	1	4.669

$$\Sigma = 108.358$$

Area ( $h_1 - h_6$ )

$$T.A = \frac{b}{3} \times 108.358$$

$$T.A = \frac{30}{3} \times 108.358$$

$$\text{Total Area} = 1083.58 \text{ m}^2$$



Length of Curve.

$$L = \frac{\pi R \phi}{180}, \quad L = \frac{3.14 \times 938 \times 20^\circ 40'}{180}$$

$$L = 338.16 \text{ m}$$

Chainage of Point of Intersection = 3169 m  
minus tangent = -171.02

$$\begin{aligned} \text{Chainage of } T_1 &= 2997.98 \text{ m} \\ &+ \\ &L (338.16 \text{ m}) \end{aligned}$$

$$\text{Chainage of } T_2 = 3336.14 \text{ m}$$

Length of 1<sup>st</sup> Chord (C<sub>1</sub>)

$$= 3014.56 - 2997.98$$

$$= 16.56 \text{ m}$$

C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, C<sub>9</sub>, ~~C<sub>10</sub>~~

$$C_{11} = 3336.13 - 3317.78$$

$$C_{11} = 18.40 \text{ m}$$

Q No: 2) :- Given Data:-

**ID: 7669**

Circular Radius.

$$= 7669 - 7200$$

$$= 469 \text{ m}$$

"We minus 7200  
from  
our  
ed."

for R.

Deflection Angle. =  $20^{\circ} 40'$

Point of Intersection.

$$7669 - 4500$$

$$= 3169 \text{ m}$$

"We minus 4500  
from our  
ed"

Interval = 20m

Sol:

$$R = 469 \times 2 = 938 \text{ m}$$

$$BT_1 = BT_2 = R \tan \phi/2$$

$$BT_1 = BT_2 = 938 \tan 20^{\circ} 40'$$

$$\boxed{BT_1 = BT_2 = 171.02 \text{ m}}$$

By Deflection Method:

$$\delta_1 = \frac{1718.9 \times 16.56}{60 \times 938}, \delta_1 = 0^\circ 50' 57''$$

$$\delta_2 = \frac{1718.9 \times 20}{60 \times 938}, \delta_2 = 0^\circ 6' 10.83''$$

$\delta_2, \delta_3, \delta_4, \delta_5, \delta_6, \delta_7, \delta_8, \delta_9, \delta_{10}$

$$\delta_{11} = \frac{1718.9 \times 18.40}{60 \times 938}, \delta_{11} = 0^\circ 56' 19.71''$$

Total deflection Angle for the chord is,

$$\Delta_1 = \delta_1 = 0^\circ 50' 57''$$

$$\Delta_2 = \delta_1 + \delta_2 = 0^\circ 50' 57'' + 0^\circ 6' 10.83''$$

$$\Delta_2 = 0^\circ 57' 7.83''$$

$$\Delta_3 = 1^\circ 48' 4.83''$$

$$\Delta_4 = 2^\circ 39' 1.83''$$



$$\Delta_5 = 3^\circ 29' 58.89''$$

$$\Delta_6 = 4^\circ 20' 55.88''$$

$$\Delta_7 = 5^\circ 11' 52.83''$$

$$\Delta_8 = 6^\circ 2' 49.83''$$

$$\Delta_9 = 6^\circ 53' 46.83''$$

$$\Delta_{10} = 7^\circ 44' 43.88''$$

$$\Delta_{11} = 8^\circ 35' 40.83''$$

$$\text{Check :- } \phi/2 = \frac{20^\circ 40'}{2}$$

$$= 10^\circ 20'$$

---

---

Q No: 3) :- Given Data :-

ID :- 7669

$$\Delta Akm = 130^\circ$$

$$\Delta kmc = 140^\circ$$

→ 1<sup>st</sup> Arc Radius :-

$$(7669 - 300) = 7369 \text{ m.}$$

→ 2<sup>nd</sup> Arc Radius :-

$$(7669 - 200) = 7469 \text{ m.}$$

→ Chainage of Intersection Point :-

$$\begin{aligned} & 7669 - 400 \\ & = 7269 \text{ m} \end{aligned}$$

Required :-

Tangent Points ?

Compound Curvature = ?

$$\alpha = 180^\circ - 130^\circ = 50^\circ$$

$$\beta = 180 - 140 = 40^\circ$$

$$\phi = \alpha + \beta, \quad \phi = 50 + 40, \quad \phi = 90^\circ$$

$$KT_1 = KM_1 = R_1 \tan\left(\frac{\alpha}{2}\right)$$

$$KT_1 = 7369 \tan\left(\frac{50^\circ}{2}\right)$$

$$KT_1 = KM = 3436.22 \text{ m}$$

$$MN = MT_2 = R_2 \tan\left(\frac{\beta}{2}\right)$$

$$MN = 7469 \tan\left(\frac{40^\circ}{2}\right)$$

$$MN = MT_2 = 2718.49 \text{ m}$$

$$KM = MT_2 + KT_1$$

$$KM = 2718.49 + 3436.22$$

$$KM = 6154.71 \text{ m}$$

$$\frac{BK}{MK \sin \beta} = \frac{1}{\sin I}, \quad BK = \frac{MK \sin \beta}{\sin I} = \frac{6154.71 \times \sin 40^\circ}{\sin 90^\circ}$$

$$BK = 3956.17 \text{ m}$$

$$BM = \frac{MK \sin \alpha}{\sin I} = BM = \frac{6154.71 \times \sin 50^\circ}{\sin 90^\circ}$$

$$BM = 4714.78 \text{ m}$$



$$T_L = KT_1 + BK, 3436.22 + 3956.17 = \boxed{7392.39 \text{ m} = T_L}$$

$$T_S = NT_2 + BM, 2718.49 + 4714.78 = \boxed{7433.27 \text{ m} = T_S}$$

$$L_L = \frac{\pi R_L \alpha}{180} = \frac{\pi \times 7369 \times 50}{180} = \boxed{L_L = 6427.40 \text{ m}}$$

$$L_S = \frac{\pi R_S \beta}{180} = \frac{3.14 \times 7469 \times 40}{180} = \boxed{L_S = 5211.70 \text{ m}}$$

Chainage of Intersection Point<sub>1</sub> = 7269 m

Chainage of Intersection point

$$-T_L = -7392.39 \text{ m}$$

Chainage of  $T_L = -123.39 \text{ m}$

plus  $L = +6427.40$

$$= 6304.01 \text{ m}$$

Chainage of Compound Curve<sub>1</sub>

(iv) plus  $L_S = 5211.70 \text{ m}$ .

Chainage of  $T_L = 11515.71 \text{ m}$



