

Name

Tariq

Kheir

ID

7962

Section

B

exam

mid-term

Assignment

Advance

Survey

Q No 1

Part A

P11

Given Data

ID. Tangent meet at change = 7962

Deflection

Angle = $14^{\circ}13'2''$

Degree

of

curve = 5°

Required Data

- ⇒ Radius
- ⇒ Tangent length
- ⇒ length of curve
- ⇒ chainage of intersection point
- ⇒ length of chord
- ⇒ mid ordinat
- ⇒ External distance.

Solution

$$D = 5''$$

$$R = 5729.58/D$$

$$R = 5729.58/D$$

$$R = 1145.917$$

$$\text{Tangent length} = RT_1 - BT_2 = R \tan(\theta/2)$$

~~$$RT_1 - BT_2 = RT_1 - RT_2$$~~

$$Bt_1 = Bt_2 = 1145.91 \text{ x tens} \quad \left(\frac{14^\circ 13' 23''}{2} \right)$$

$$Bt_1 = Bt_2 = 142.96 \text{ ft.}$$

length of curve

$$L = \frac{\pi r \theta}{180^\circ} = \frac{\pi \times 1145.917 \times 14^\circ 13' 23''}{180^\circ}$$

$$L = 284.45 \text{ ft}$$

chainage of intersection point = 7962

-ve tangent length = -142.96 ft

change length of $t_1 = 7819.1$

plus $L = + 284.45 \text{ ft}$

change of $t_2 = 8103.5$

length of chord :: L

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

$$\Rightarrow 2 \times 1145.91 \times \sin \left(\frac{14^\circ 13' 23''}{2} \right)$$

$$\Rightarrow 283.72 \text{ ft.}$$

Mid ordinat

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

$$\Rightarrow 1145.91(1 - \cos(\frac{14^{\circ} 13' 23''}{2}))$$

$$\Rightarrow \boxed{8.81 \text{ ft}}$$

External Distance

$$\Rightarrow R(\sec(\phi/2) - 1)$$

$$\Rightarrow 1145.91(\sec(14^{\circ} 13' 23'') - 1)$$

$$\Rightarrow \boxed{8.885 \text{ ft}}$$

Q No 1 Part B

$$\begin{aligned} \text{First offset} &= 7962 = 7962/1000 \\ &= 7.962 \end{aligned}$$

	0	30	60	90	120	150	$P=4$
chainage	7.962	7.962+3	7.962+4	7.938-2	7.962+1	7.962-3	
offset		10.962	11.962	5.962	3.962	4.962	

There we have 6 offset and 6 intercept and Simpson one third Rule.

offset No	offset	Simpson Multiplier	product
1	7.968	1	7.968
	10.962	4	43.848
	11.962	2	23.924
	5.968	4	23.872
	3.968	2	7.936
	4.968	1	4.968

$$\underline{\underline{Area}} = (h_1 - h_0)$$

$$h/3 (112.516)$$

$$\frac{30}{3} (112.516)$$

$$\frac{30}{3} = 10 \times 112.516$$

Q NO 3 =Given Data

$$\Delta AKM = 130^\circ$$

$$\Delta = \cancel{AKM} \quad KMC = 140^\circ$$

1st Arc radius = $(7962) - 300 = 7662m$

2nd Arc radius = $(7962 - 200) = 7762m$

change of intersection point = $(7962 - 400)$

$$= 7562m$$

Sol

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

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

$$C = A + B = 90^\circ$$

$$I = 180 - C$$

$$I = 180^\circ - 90^\circ = 90^\circ$$

$$KT_1 = KN \Rightarrow R \tan (A/2) \\ \Rightarrow 7962 \tan (50/2)$$

$$\Rightarrow 3712.7m$$

$$MN = MT_2 = R \tan (B/2) \\ = 7762 \tan (40/2)$$

$$= 2825.13m$$

$$MN = MT_2 + MN$$

$$P=6$$

$$= 3712.7 + 2825.13$$

$$= 6537.87$$

Now by Sin Rule

$$\frac{BK}{\sin \beta} = \frac{MK}{\sin(\alpha)}$$

$$BK = \frac{MK \sin \beta}{\sin(\alpha)} = \frac{6537.87 \sin 40^\circ}{\sin 90^\circ} =$$

$$BK = 4202.46 \text{ m}$$

$$BM = \frac{MK \sin \alpha}{\sin(\beta)} = \frac{6537.87 \sin 50^\circ}{\sin(90^\circ)} =$$

$$BM = 5008.29$$

$$TL = KT_1 + BK = 3712.7 + 4202.46 =$$

$$TL = 7915.16$$

$$TS = MT_2 + BM = 2825.13 + 5008.29 =$$

$$TS = 7833.42$$

$$LS = \frac{\pi R \alpha}{180} = \frac{\pi \times 7662 \times 40}{180} = 5349.08$$

$$LL = \frac{\pi R L \alpha}{180^\circ} = \frac{\pi \times 7662 \times 56}{180^\circ} \quad P=7$$

$$= 6686.35$$

Chainage of intersection point = 7562

$$-T_2 = -7915.16$$

$$\Rightarrow -353.16$$

Chainage of $T_1 = -353.16$

$$\text{plus} = + 6686.35 \text{ m}$$

Chainage of compound curve (N)

$$\boxed{\text{Plus} = 5349.08 \text{ m}}$$

Q No 2

Given Data

$$\text{circular Radius} = 7662 - 7300 = \boxed{362} \text{ A.U}$$

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

$$= 7662 - 5480 \text{ Assume value}$$

$$\boxed{= 2182}$$

$$\text{Interval} = 20 \text{ m}$$

Sol.

P. 8

$$R = 362 \times 2 = 724$$

$$BT_1 = BT_2 = R \tan \theta/2 = 724$$

$$BT_1 = 136.54$$

length of curve

$$L = \frac{\pi \times R}{180^\circ}$$

$$\frac{\pi \times 724 \times 204^\circ}{180^\circ}$$

$$L = 261.14 \text{ m}$$

change point of intersection = 2182

minus tangent = +138.54m

change of $T_2 = 2045.46$

plus $L = 261.14 \text{ m}$

change of $T_2 = 2306.6$

length of first chord $C_1 = 2060 - 2045.46$
A-U

$$= 14.54 \text{ m}$$

By Deflection method

$$S_1 = \frac{1718.9 \times C_1}{60R} = \frac{1718.9 \times 14.54}{60 \times 724}$$

$$= \frac{24992 \cdot 806}{43440}$$

$$P=9$$

$$S_1 = 0^\circ 34' 31.23''$$

$$S_2 = \frac{1718.9 \times 20}{60 \times 724} = 0^\circ 47' 29.01''$$

$$S_2 = S_3 = S_4 = S_5 = S_6 = S_7 = S_8 = S_9 = S_{10} = 20''$$

$$S_{11} = \frac{1718.9 \times 21.23}{60 \times 724} = 0^\circ 50' 24.22''$$

Total deflection (cumulative) Angle per

$$\Delta_1 = S_1 = 0^\circ 34' 31.23''$$

$$\Delta_2 = S_1 + S_2 = 0^\circ 47' 29.01'' + 0^\circ 34' 31.23''$$

$$\Delta_3 = 1^\circ 50' 31.20'' = 1^\circ 22' 0.13''$$

$$\Delta_4 = 2^\circ 31' 2.38''$$

$$\Delta_5 = 3^\circ 5' 33.5''$$

$$\Delta_6 = 3^\circ 40' 4.62''$$

$$\Delta_7 = 4^\circ 14' 35.75''$$

$$\Delta_8 = 4^\circ 49' 6.87''$$

$$\Delta_9 = 5^\circ 23' 37.99''$$

$$\Delta_{10} = 5^\circ 58' 9.12''$$

$$\Delta_{11} = 6^\circ 32' 40.24''$$

$$\text{check} = \frac{2040}{2}$$

$$= 10^\circ 20' \text{ Ang}$$

