Scheme and Solution

Advanced Surveying 18CV45 - IAT#3

Date: 02/08/2021

Qn #1: Writing the complete table ⇔ 10 marks

Qn#2: Sketch ⇔ 3 marks

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} \Leftrightarrow \frac{ff_1}{f_1} = \frac{ff_1}{f_1} + \frac{ff_1}{f_2}$$

$$f_1 = f + f\left(\frac{f_1}{f_2}\right). \qquad \frac{f_1}{f_2} = \frac{s}{i} \quad (3m)$$

$$\Rightarrow f_1 = f + f\left(\frac{s}{i}\right) \text{---} (i)$$

$$D = f_1 + d \Leftrightarrow f + f\left(\frac{s}{i}\right) + d.$$

$$= f\left(\frac{s}{i}\right) + (f + d) \quad (2m)$$

$D = ks + c$, $k = \frac{f}{i}$ = multiplying const

$c = (f + d)$ = additive const (2m)

Qn #3: Sketch: ⇔ (3m)

Derive: $D = ks\cos^2\theta + c\cos\theta$ ⇔ (4m)

Derive: $V = \frac{ks\sin 2\theta}{2} + c\sin\theta$ ⇔ (3m)

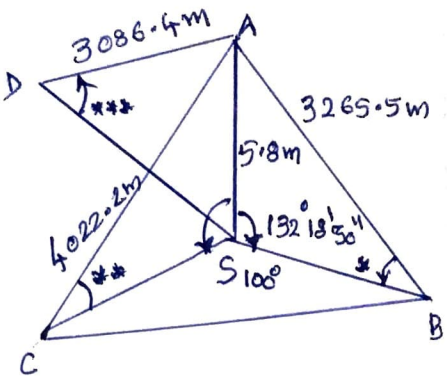
Qn #4: $\frac{5.60}{\sin\alpha} = \frac{3265.50}{\sin 132^\circ 18' 30''}$ ⇔ $\alpha = 0^\circ 4' 31''$ (3m)

$\beta = 180^\circ - (\alpha + 132^\circ 18' 30'') = 47^\circ 36' 59'' N.$ (3m)

$\angle ASC = 127^\circ 35' 54''$

$\beta' = \frac{5.80 * \sin 232^\circ 24' 6''}{4022.20}$ (2m)

$= -0^\circ 3' 55.6''$



$\therefore$ Direction of $AC = 232^\circ 20' 10.3''$

Direction of $AD = \theta + \beta = 296^\circ 6' 11'' - 0^\circ 5' 48'' = 296^\circ 0' 23''$ (2m)

Qn#5: Observations from A to P:

$D = KS\cos^2\theta = 100 * 1.65 * \cos^2(2^\circ 24') = 164.71m.$ (2m)

$V = \frac{KS\sin 2\theta}{2} = \frac{100 * 1.65 * \sin(2 * 2^\circ 24')}{2} = 6.903m$

RL of P = 77.450 + 1.420 + 6.903 − 2.055 = 84.018m

Observations from B to P: (2m)

$D = KS\cos^2\theta = 100 * 2.030 * \cos^2(-3^\circ 36') = 202.200m$

$V = \frac{KS\sin 2\theta}{2} = \frac{100 * 2.030 * \sin 2(-3^\circ 36')}{2} = -12.721m$

RL of P = 97.135 + 1.40 − 12.721 = 1.800 = 84.014m.

$D' = \frac{84.018 + 84.014}{2} = 84.016m.$ (3m)

$D = 164.71 + 202.200 = 366.910m$ (3m)

Qn#6: Sketch :: (3m) Elements :: (7m)

Qn#7: Sketches :: (4m) Concept :: (6m)

End of scheme !!