

OBSERVATIONS TABLE

Sr.No.	Pressure Difference in term of mm of Hg (ΔP)	Time Required for 10 cm Rise in Water (Sec)
1	58	20.65
2	42	24.30
3	27	30.20
4	16	41

Sr.No.	Pressure Difference in term of mm of Hg ΔP	Time Required for 10 cm Rise in Water (Sec)	Pressure Difference in m of Water $h=12.6 * \Delta P /1000$
1	58	20.65	0.730
2	42	24.30	0.529
3	27	30.20	0.340
4	16	41	0.201



CALCULATIONS

- Area of Measuring Tank
- $A = 300 * 300 \text{ mm}^2$
- $A = 0.09 \text{ m}^2$

- $H = 10 \text{ cm}$
- $H = 0.1 \text{ m}$

- $Q_{\text{actual}} = (A * H) / \text{Time}$

- Trial 1

$$Q_{\text{actual}} = 0.09 * 0.1 / 20.65$$

$$Q_{\text{actual}} = 4.35\text{E-}04$$

- Trial 2

$$Q_{\text{actual}} = 0.09 * 0.1 / 24.30$$

$$Q_{\text{actual}} = 3.70\text{E-}04$$

- Trial 3

$$Q_{\text{actual}} = 0.09 * 0.1 / 30.32$$

$$Q_{\text{actual}} = 2.98\text{E-}04$$

- Trial 4

$$Q_{\text{actual}} = 0.09 * 0.1 / 41$$

$$Q_{\text{actual}} = 2.19\text{E-}04$$



THEORETICAL CALCULATIONS

- D1= inlet Diameter = 21.5mm
- D2= Throat Diameter = 12.5mm

- $A1 = \pi * d1^2 / 4 = 359.68E-06$
- $A2 = \pi * d2^2 / 4 = 122.71E-06$

- $$Q_{th} = \frac{a_1 a_2 \sqrt{2gh}}{\sqrt{a_1^2 - a_2^2}}$$

- $Q_{th} = 5.77E-04 \sqrt{h}$

- Trial 1

$$Q_{th} = 5.77E-04 * (0.73)^{(1/2)}$$

$$Q_{th} = 4.940E-04$$

- Trial 2

$$Q_{th} = 5.77E-04 * (0.529)^{(1/2)}$$

$$Q_{th} = 4.197E-04$$

- Trial 3

$$Q_{th} = 5.77E-04 * (0.340)^{(1/2)}$$

$$Q_{th} = 3.365E-04$$

- Trial 4

$$Q_{th} = 5.77E-04 * (0.73)^{(1/2)}$$

$$Q_{th} = 2.59E-04$$



RESULT TABLE

Sr.No.	Pressure Difference in term of mm of Hg ΔP	Time Required for 10 cm Rise in Water (Sec)	Pressure Difference in m of Water $h=12.6 * \Delta P /1000$	Q actual	Q theoretical	Cd
1	58	20.65	0.730	4.35E-04	4.940E-04	0.88
2	42	24.30	0.529	3.70E-04	4.197E-04	0.881
3	27	30.20	0.340	2.98E-04	3.365E-04	0.885
4	16	41	0.201	2.19E-04	2.590E-04	0.845

