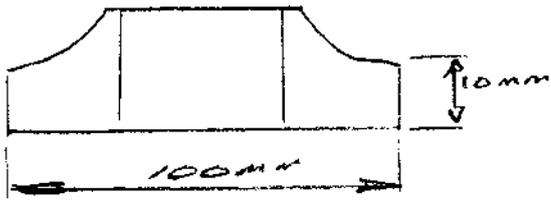


QB 1992

ASS 8 Q1

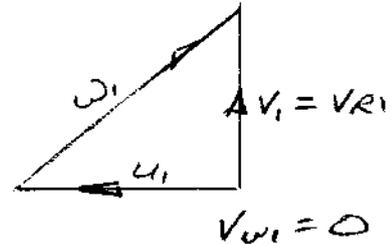
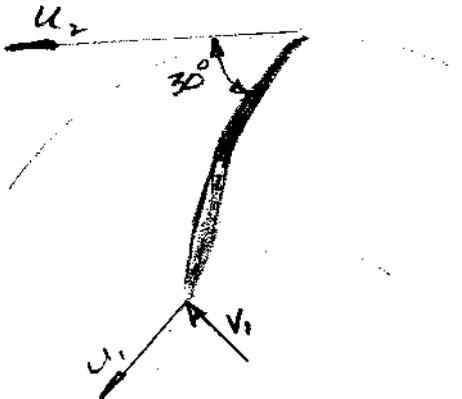


$$N = 1450 \text{ Rev/min}$$

$$K = 0.9$$

$$Q = 0.008 \text{ m}^3/\text{s}$$

INLET

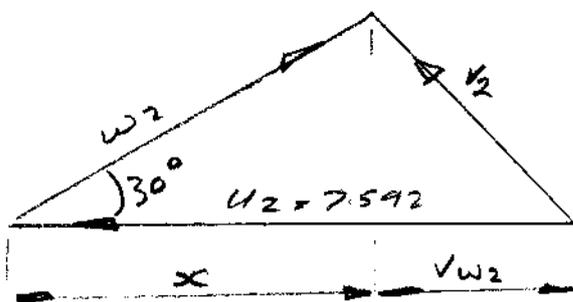


$$V_{R2} = Q/A_2 = \frac{0.008}{\pi \times 1 \times 0.1 \times 0.9}$$

$$V_{R2} = 2.829 \text{ m/s}$$

OUTLET

$$U_2 = \pi N D_2 = \pi \times \frac{1450}{60} \times 1 = 7.592 \text{ m/s}$$



$$V_{R2} = 2.829$$

$$x = \frac{2.829}{\tan 30^\circ} = 4.9 \text{ m/s}$$

$$V_{w2} = 7.592 - 4.9 = 2.692 \text{ m/s}$$

$$V_2 = \sqrt{2.692^2 + 2.829^2} = 3.906 \text{ m/s}$$

$$\text{KINETIC HEAD} = \frac{V_2^2}{2g} = \frac{3.906^2}{2g} = 0.777 \text{ m}$$

$$\text{LOSS IN CHAMBER} = 25\% \times 0.777 = 0.194 \text{ m}$$

$$\text{MANOMETRIC HEAD} = \frac{U_2 V_{w2}}{g} = \frac{7.592 \times 2.692}{g} = 2.08 \text{ m}$$

$$\text{DEVELOPED HEAD} = 2.08 - 0.194 = \underline{1.89 \text{ m}} \text{ ANS}$$

$$\Delta h = \frac{U_2 V_{w2}}{g} = \left(\frac{U_2}{g} \right) (U_2 - \frac{Q}{A_2 \tan \alpha})$$

When no flow $Q = 0$

$$\Delta h = \frac{7.592}{g} (7.592 - 0) = \underline{5.875 \text{ m}} \text{ ANS}$$