

Question 1

$$C_d = 3.2$$

$$b = 3.5 \text{ m}$$

$$H = 0.42 \text{ m}$$

$$\begin{aligned} Q &= C_d b H^{1.5} \\ &= 3.2 \times 3.5 \times 0.42^{1.5} \\ &= \underline{\underline{3.05 \text{ m}^3/\text{s}}} \end{aligned}$$

Question 2

$$C_d = 3.1$$

$$b = 5.0 \text{ m}$$

$$H = 0.38 \text{ m}$$

$$\begin{aligned} Q &= C_d b H^{1.5} \\ &= 3.1 \times 5.0 \times 0.38^{1.5} \\ &= \underline{\underline{3.63 \text{ m}^3/\text{s}}} \end{aligned}$$

Question 3

$$C_d = 0.62$$

$$H = 0.25 \text{ m}$$

$$\theta = 60^\circ$$

$$\begin{aligned} Q &= \frac{8}{15} C_d \tan \frac{\theta}{2} \sqrt{2g} H^{2.5} \\ &= \frac{8}{15} \times 0.62 \times \tan \frac{60}{2} \times \sqrt{2 \times 9.81} \times 0.25^{2.5} \end{aligned}$$

$$= \frac{8}{15} \times 0.62 \times \tan \frac{60}{2} \times \sqrt{2 \times 9.81} \times 0.25^{2.5}$$

$$= \frac{8}{15} \times 0.62 \times 0.578 \times 4.43 \times 0.03125$$

$$= \underline{\underline{0.026 \text{ m}^3/\text{s}}}$$

Question 4

$$C_d = 0.6$$

$$H = 0.32 \text{ m}$$

$$\theta = 75^\circ$$

$$Q = \frac{8}{15} C_d \tan \frac{\theta}{2} \sqrt{2g} H^{2.5}$$

$$= \frac{8}{15} \times 0.6 \times \tan \frac{75}{2} \times \sqrt{2 \times 9.81} \times 0.32^{2.5}$$

$$= \frac{8}{15} \times 0.6 \times 0.767 \times 4.43 \times 0.05793$$

$$= \underline{\underline{0.063 \text{ m}^3/\text{s}}}$$

Question 5

$$C_d = 2.9$$

$$H_1 = 1.5 \text{ m}$$

$$H_2 = 1.0 \text{ m}$$

$$L = 5.0 \text{ m}$$

$$Q = C_d L \sqrt{2g} (H_1 - H_2)^{1.5}$$

$$Q = C_d L \sqrt{2g} (H_1 - H_2)^{1.5}$$

$$Q = 2.9 \times 5.0 \times \sqrt{2 \times 9.81} \times (1.5 - 1.0)^{1.5}$$

$$= 2.9 \times 5.0 \times 4.43 \times 0.3536$$

$$= \underline{22.71 \text{ m}^3/\text{s}}$$

Question 6

$$C_d = 2.7$$

$$H_1 = 1.0 \text{ m}$$

$$H_2 = 0.7 \text{ m}$$

$$L = 3.8 \text{ m}$$

$$Q = C_d L \sqrt{2g} (H_1 - H_2)^{1.5}$$

$$= 2.7 \times 3.8 \times \sqrt{2 \times 9.81} \times (1.0 - 0.7)^{1.5}$$

$$= 2.7 \times 3.8 \times 4.43 \times 0.1643$$

$$= \underline{\underline{7.47 \text{ m}^3/\text{s}}}$$