

SECTION-1

Q2
Ans

Given : Discharge, $Q = 400$ litres/sec, Bed slope, $S = 1/2000$, Chezy's constant $C = 50$

To Find : Dimension of most economical rectangular channel section.

1. Let width of channel = B , depth of channel = y
2. Most economical dimension for rectangular channel, $R = y/2$ and $B = 2y$
3. Discharge is given by, $Q = AC\sqrt{RS} = B \times C\sqrt{RS}$

$$Q = 2y^2 C \sqrt{\frac{y}{2} \times S}$$

$$\frac{400}{1000} = 2y^2 \times 50 \sqrt{\frac{y}{2} \times \frac{1}{2000}}$$

$$y = 0.577 = 0.58 \text{ m}$$

Depth

$$y = 0.58 \text{ m}$$

width

$$B = 2y = 2 \times 0.58 = 1.16 \text{ m}$$