Date :
Page No.

Section-1

Ans-2 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.

(i) Let width of channel = B,
Depth of channel = y

(ii) Most economical dimensions for rectangular channel,

$$R = y/2 \quad \text{and} \quad B = 2y$$

(iii) Discharge is given by,

$$Q = AC\sqrt{RS} = By\,C\sqrt{RS}$$

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

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

$$y = 0.577 = 0.58\ m$$

Depth, $y = 0.58\ m$
Width, $B = 2y = 2 \times 0.58 = 1.16\ m$