1.

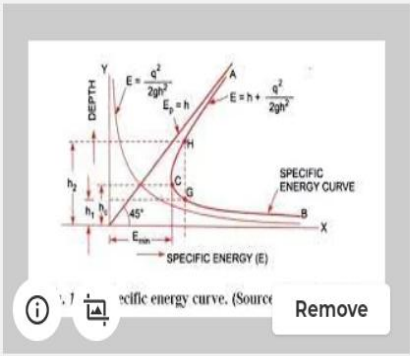
A 10 m wide rectangular channel carries a Q of 15 m^3/s (critical condition). Using g = 9.81 m/s^2, the specific energy is

2.

For a most economically trapezoidal channel section having a depth of 4 m, the bed width is equal to

3.

For a given specific energy and discharge/ per width, $q=2m^2/s$, $h_2=2h_1$. Calculate h_2.



4.

In CP, at outlet, u_2=18.98m/s, v_{f2}=3m/s, manometric head, H_m =25m & η_{man}=75%. Calculate vane angle at outlet,

Soal 1)

Lebar B = 10 m

Q = 15 m^3/s

g = 9.81 m/s

$$q = \frac{Q}{B} = \frac{15}{10} = 1.5\ m^2/s/m$$

$$y_c = \left(\frac{q^2}{g}\right)^{1/3}$$

$$q^2 = y_c^3 \cdot g$$

$$1.5^2 = (y_c)^3 \cdot 9.81$$

$$0.229 = y_c^3$$

$$y_c = 0.612$$

$$E_c = \frac{3}{2} \times y_c$$

$$E_{min} = 0.9181\ m$$

Ans 2) $B = \frac{2}{\sqrt{3}} \times D$

$$B = \frac{2}{\sqrt{3}} \times 4 = \frac{8}{\sqrt{3}} = 4.618.$$

Ans 3) $$y_1 = \left[\frac{q^2}{2g}\right]$$

$$q = 2 m^3/s$$

$$h_2 = 2h_1$$

$$h_1 = \sqrt[3]{\left[\frac{2^2}{19.62}\right]}$$

$$h_1 = 0.588$$

$$h_2 = 1.176 \text{ m}$$

Ans 4) $u_2 = 18.98$ m/s

$v_{f2} = 3$ m/s

$H_m = 25$ m

$\eta_{max.} = 75\%$

$$v_{w2} = \frac{9.81 \times 25}{\eta_{max.} \times 18.98} = \frac{9.81 \times 25}{0.75 \times 18.98}$$

$$v_{w2} = 17.23$$

$$\tan\phi = \frac{v_{f2}}{(u_2 - v_{w2})} = \frac{3}{(18.98 - 17.23)}$$

$$\tan\phi = 1.7143$$

$$\phi = \tan^{-1}(1.7143)$$

$$\phi = 59.74^\circ$$

$$\phi = 59^\circ 44' \simeq 60^\circ.$$