

Question #68668, Physics / Other

An outlet of diameter 1m is made 20m below the surface of water in a dam .what would be the force with which the water spews out when it is fully opened? (take g as 10Nkg-1 and density of water 1 gcm-3)

Solution

The pressure due to liquid column at the given depth is determined as follows.

$$p = \rho gh;$$

$$p = 1000 \times 10 \times 20 = 2 \times 10^5 \text{ Pa}$$

The total force produced by the pressure over the outlet area is calculated as follows.

$$F = pA = p \times \frac{\pi d^2}{4};$$

$$F = 2 \times 10^5 \times \frac{\pi \times 1^2}{4} = 1.57 \times 10^3 \text{ N}$$

Answer: 1.57 kN.

Answer provided by <https://www.AssignmentExpert.com>