

- (b) A 2 km long pipe, 150 mm in diameter and 8 mm thick carries water at 100 lps. Find pressure rise if valve at its end is closed in 2.5 second. Is pipe safe? Is closure rapid or slow? Take Hoop stress = 8 kN/cm², $E_{\text{steel}} = 2 \times 10^7$ N/cm² and $K_{\text{water}} = 2 \times 10^5$ N/cm² 10
- 0.7 (a) Two reservoirs with a difference in elevation of 15 m are connected by three pipes in series. The pipes are 300 m long of diameter 30 cm, 150 m long of 20 cm diameter and 200 m long of 25 cm diameter resp. The friction factor f in relation $hf = flv^2/2gD$ for the three pipes are 0.018, 0.020 and 0.019 resp. and which account for friction and all losses. The contractions and expansions are sudden. Determine the flow rate in lit/s. The loss co-efficient for sudden contraction from diameter 30 to 20 cm = 0.24. 12
- (b) A nozzle is fitted to a pipe 100 mm diameter and 250 m long with coefficient of friction as 0.01. If the head available at nozzle is 120 m. Find max. power transmitted by jet of water freely out of nozzle and diameter of the nozzle. 8
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