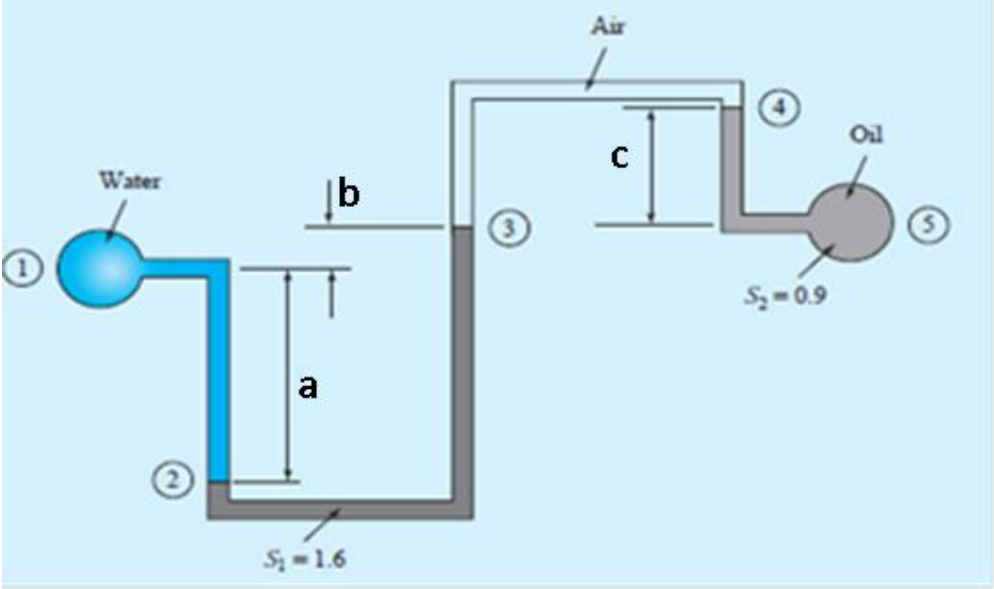


Water ($\gamma = 9810 \text{ N/m}^3$) and oil flow in horizontal pipelines. A double U-tube manometer is connected between the pipelines, as shown in Figure below. Calculate the pressure difference between the water pipe and the oil pipe if $a = 40 \text{ cm}$, $b = 10 \text{ cm}$, $c = 20 \text{ cm}$.



$$p_1 = p_2 - S_2 \gamma c + S_{Air} \gamma c + S_1 \gamma (a + b) - \gamma a$$

$$p_1 - p_2 = \gamma (-S_2 c + S_1 (a + b) - a) = 9,810 \times (-0.9 \times 0.2 + 1.6 \times 0.5 - 0.4) = 2156 \text{ Pa} \approx 2.2 \text{ kPa}$$