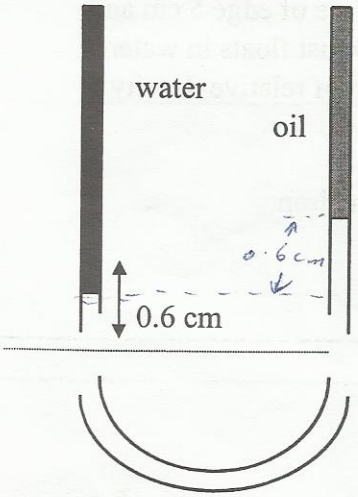
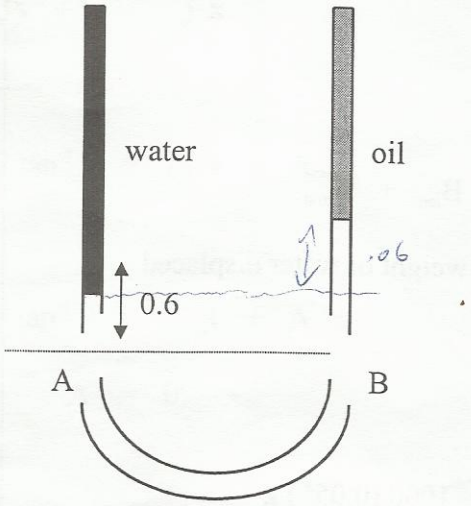
1999

9 (a) A U-tube whose limbs are verical and of equal length has mercury poured in until the level is 50 cm from the top in each limb. Water is poured into one limb and oil into the other until the U-tube is filled. The difference in height of the mercury levels is 0.6 cm.
[Diagram not to scale].

If the relative density of mercury is 13.6, find the relative density of the oil correct to two places of decimals.





Length of oil column = 50 - 0.3 = 49.7 cm

Length of water column = 50 + 0.3 = 50.3 cm 5

Pressure at B = Pressure at A 5

ρ g (0.497) + 13 600 g (0.006) = 5

1000 g (0.503) 5

0.497 ρ = 503 - 81.6

ρ = 847.887

Relative density = 0.85 5