HOME ASSIGNMENT

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Q1) Let v be the volume of bottle whose mass is 35gm
when filled with water the bottle $m_w = 65 - 35 = 30g$
Density of water = $\rho_w = 1 \Rightarrow \frac{30}{v} = 1 \Rightarrow 30 = v$
when it is filled v v
with alcohol = 59g
= Mass of alcohol = $m_a = 59 - 35 \Rightarrow 24g$
= Density of Alcohol = mass / volume = $\frac{24}{30} = 0.89/c$

$\therefore$ Relative Density = $\frac{\text{Density of Alcohol}}{\text{Density of water}} = 0.8$

Q2) Density bottle is a small glass bottle having a glass stopper at its neck. The Bottle can store a fixed volume of a liquid. Generally the volume of bottles is 25 ml or 50ml.
Stopper has a narrow hole through it. when bottle is filled with liquid and stopper is inserted, the excess liquid rises through the hole and drains out. Thus the bottle will contain the same of liquid each time when it is filled. It is used to determine the density of a liquid.

Q3) Density

→ It is defined as mass per volume.

→ Its value of different in different system of measurement.

→ Its units are gcm^{-3}. and kgm^{-3}

Relative Density

→ It is defined as the ratio of density of the substance to density of water at 4°.

→ Its value is the same in all systems of measurement.

→ It has no units.

Q4) The statement "Relative Density of alluminium is 2.7 means. A peace of alluminium of any volume has mass 2.7 times that of equal volume of water.

Q5) Density of water is $1 g cm^3$

∴ Volume of density bottle = weight of ~~bottle~~ water in grams completely filling the bottle

Volume of Density Bottle:

Mass of empty density bottle = M_1 = 21.8 g

Mass of bottle + water = M_2 = 41.8 g

∴ Mass of water completely fitting the density bottle

$= M_2 - M_1$

$= 41.8 - 21.8$

$= 20 g$

But 1g of water has volume = 1cc

∴ volume of bottle (density of bottle) = volume of water = 20 c.c = 20ml

ii) Density of bottle is the mass over the volume

$\frac{21.8}{20} = 1.09\ cm^3$

= the mass of liquid is 40.6 − 21.8 = 18.8g

= The density of liquid is $\frac{18.8}{20} = 0.94\ g/cm^3$

The Relative Density is density of liquid over density of water.

= 0.94 ÷ 1 = 0.94

iii) Mass of empty bottle, $M_1 = 22g$

Mass of bottle + water, $M_2 = 50g$

Mass of bottle + brine solution, $M_3 = 54g$

Mass of water = $M_2 - M_1 = 50 - 22 = 28g$

Mass of brine solution = $M_3 - M_1 = 54 - 22 = 32g$

Density of brine solution = Mass of brine solution by mass of water.

$= \frac{32}{28} = 1.14\ g/cm^3$