HOMEWORK

(1) ans- Given, Mass of empty density bottle $M_1 = 35g$

Mass of bottle + water $M_2 = 65g$
Mass of bottle + Alcohol $M_3 = 59g$

Relative density of alcohol

$$= \frac{\text{Mass of alcohol}}{\text{Mass of equal volume of water}}$$

$$= \frac{M_3 - M_1}{M_2 - M_1} = \frac{59-35}{65-35} = \frac{24}{30} = 0.8$$

(2) ans- A density bottle is a specially designed bottle which is used to determine the density of a liquid. ~~Using this~~ To determine the density of a liquid using the density bottle, we have to measure the mass of liquid and mass of water taken in it by using the common balance, the mass of water in the density bottle gives the volume of liquid.

(3) ans-

Density	Relative density
1. It is defined as mass per unit volume.	1. It is defined as the Ratio of density of the substance to density of water at $4°$.
2. Its ~~value~~ is different	

in different systems of measurement.	2. Its value is the same all systems of measurement.
3. Its units are gm^{-3} and $kg\ m^{-3}$.	3. It has no units.

(4.) ans- Relative density of aluminium is 2.7, means that a piece of aluminium of any volume has mass 2.7 times that of an equal volume of water.

(5) ans- Solution

a) Density of water = $1g/cm^3$
volume of density bottle
Mass of empty density bottle = $M_1 = 21.8g$
Mass of bottle + water = $M_2 = 41.8g$
So mass of water completely filling the density bottle = $M_2 - M_1$
$= 41.8 - 21.8 = 20g$
$1g$ of water has volume = cc
So volume of bottle = Volume of water = $20 cc$
$\qquad\qquad\qquad\qquad\qquad\qquad = 20ml$

b) The relative density of liquid
Mass of $20cc$ of liquid
= (Mass of density bottle + Mass of $20cc$ of liquid) - mass of density bottle.
$= 40.6 - 21.8 = 18.8g$

Mass of 20cc of water = 20g

Relative doensity of liquid

R.D = $\dfrac{\text{Density of the substance}}{\text{Density of liquid}}$

$= \dfrac{18.8}{20} = 0.94$

⑥ans - 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 $= \dfrac{\text{Mass of brine}}{\text{Mass of water}}$

solution

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