S.1 REVISION

Exercise 1.

Length

Convert the following as instructed:

(i) 15.4mm to metres

(ii) 20m to centimetres

(iii) 0.072km to metres

(iv) 350cm to metres

Exercise 2.

Mass

Convert the following as instructed:

(i) 10000grams to kilograms

(ii)3kg to dg

(iii) 40mg to kg

(iv) 230.45g to cg

Exercise 3.

Area

Convert the following as instructed

(i) 25 mm^2 to cm^2

(ii) 20 m^2 to mm^2

(iii) 17.4 mm^2 to m^2

Exercise 4.

Volume

Convert the following as instructed

(i) 350 cm^3 to m^3

(ii) 500ml^3 to m^3

(iii)100000 litres to m^3

Exercise 5.

1. A cuboid has dimensions 2cm by 10cm. Find its width in metre if it occupies a volume of 70cm^3.

2. (a) Find the volume of water in a cylinder of water radius 6cm if its height is 10cm

   (b) The volume of the cylinder was 140m^3 .When a stone was lowered in the cylinder filled with water the volume increased to 15cm3 .

   Find the height of the cylinder of radius 7cm.

3. A Perspex box has 10cm square base and contains water to a height of 20cm. A piece of rock of mass 600g is lowered gently into the water and the level rises to 12cm. Find the;

   (i) Volume of water displaced by the rock.

   (ii) volume of the rock in and

   (iii) density of the rock in

EXERCISE 6.

DENSITY.

1. A Perspex box has a 5cm square base containing water to a height of 10 cm. A piece of rock of mass 600g is lowered into the water and the level rises to 12 cm.

(a) What is the volume of water displaced by the rock?

(b) What is the volume of the rock?

2. The mass of 25.4cm^3 of mercury is 332g. Find the density of mercury**.**

3. An 800g solid measures 10cm by 5cm by 4cm. Determine its density**.**

4. A glass stopper of volume 16cm3 weighs 60g. Calculate its density in :

   (i) gcm^{-3}**.**

   (ii) kgm^{-3}**.**

5. The density of copper is 6.9gcm^{-3} . What is the mass of 100cm3 of copper?

   When a piece of irregular stone of mass 400g is lowered in a measuring cylinder, the initial and final volumes were 500cm^3 and 600cm3 respectively. Calculate the density of the stone**.**

6. An empty beaker weighs 140g in air and 180g when filled with 75cm3 of methylated spirit. Find the density of methylated spirit.

7. What is the mass of 1.5litres of water?

8. The oil level in a burette is 25cm^3 . 100 drops of oil fall from a burette. If the volume of one drop is 0.1cm^3 .What is the final oil level in the burette.

9. A measuring cylinder has water level of 13cm.What will be the new water level if 1.6g of a metallic block of density 0.8g/cm^3 is added.

10. A perspex box having 6cm square base contains water to a height of 10cm.

    Find the volume of water in the box

11.A stone of mass 120g is lowered into the box and the level of water rises to 13cm.

(i) Find the new volume of water?

(ii) Find the volume of the stone?

11. Liquids X and Yare mixed to form a solution. If the density of X is $0.8gcm^{-3}$ and volume is $100cm^3$, density of Y $1.5cm^{-3}$ and its volume is $300m^3$ .Find the;

(i) mass of liquid X

(ii) mass of liquid Y

(iii) Density of a mixture

12. In an experiment to determine the density of a pin, 100pins are gently lowered into a measuring cylinder containing $12cm^3$ of water. The water in the cylinder rose to $98cm^3$. Find the;

(i) volume of a pin.

(ii) density of the pin in kgm^{-3}

Exercise 7.

DENSITY OF MIXTURES.

1. An alloy is formed by adding 500g of element P of density 5gcm-3 to 400cm3 of element Q of density 4gcm-3 . Calculate the density of the alloy.

2 500cm3 of liquid X of density 2gcm-3 is combined with 200 g of liquid Y of density 4gcm-3 . Calculate the density of the mixture.

3. Liquid M of density 0.5gcm-3 is mixed with liquid N in equal volumes. If the mixture has a density of 0.8gcm-3 , Find the density of liquid N.

4. $3cm^{-3}$ of water was mixed with $5cm^{-3}$ of milk of density 1500kgm-3. Find the density of the mixture.

5. Liquid A of volume 400cm3 and density 800kgm-3 is mixed with liquid B of volume 600cm^3 and density 1120kgm^{-3} . Calculate the density of the mixture.

Exercise 8.

1. A bottle full of water has a mass of 45g, when full of ethanol, its massis36g. If the empty bottle weighs 20g, calculate the density of ethanol.

2. Density bottle has a mass of 70g when empty, 90g when full of water and 94g when full of liquid. Find the relative density of the liquid and its density.

3. An empty 60-litre petrol tank weighs10kg. What will be its mass when full of petrol of relative density 0.72?

4. A density bottle was used to measure the relative density of a liquid and the following results were obtained.

   Mass of empty bottle : =20g

   Mass of bottle full of water : =130g

   Mass of bottle full of liquid : =110g

   Calculate the density of the liquid**.**

5. An empty density bottle is 56.00g. When fully filled with water, it weighs 86.00g. It weighs 86.00g when full of an unknown liquid. Find the density of the liquid.

6. A piece of aluminum weighs 80N in air and 50.37N when completely immersed in water. Calculate the relative density of aluminum.

7. Two solid cubes have the same mass but their surface areas are in the ratio of

1 : 16 What is the ratio of their densities?

A. 1 : 2 B. 4 : 1

C. 64 : 1 D. 1 : 64

9. A metal cuboid of dimensions 3 cm by 2 cm by 1 cm and 8.9 g cm-3 is completely immersed in a liquid of density 0.8 g cm-3. The mass of the liquid displaced is.

A. 53.4 g. C. 29.1 g.

B. 7.5 g. D. 4.8 g.

10. 0.002m3 of a liquid of density 800kgm^{-3} is mixed with 0.003m^{3} of another liquid of density 1200kgm-3 . What is the density of the mixture?

A. 1,000 kgm^{-3} B. 4,000 kgm^{-3}

C. 2,500 kgm^{-3} D. 1,040 kgm^{-3}

11. A bottle weighs 160 g when empty, 760 g when filled with water, and 1 kg when filled with a certain liquid. Calculate the volume of the liquid in bottle.

A: 160 cm^{3} B: 600 cm^{3} C: 760 cm^{3} D: 1000 cm^{3}

12. What mass of lead has the same volume as 1600 kg of petrol?

{Density of lead = 11400 kg m^{-3} , Density of petrol = 800 kg m^{-3}}

A. 22 800 kg C. 1600 kg

B. C. 11400 kg D. 800 kg

13. A metal cuboid of dimensions 3 cm by 2 cm by 1 cm and 8.9 g cm-3 is completely immersed in a liquid of density 0.8 g cm-3. The mass of the liquid displaced is;

A. 53.4 g. B. 29.1 g.

B. C. 7.5 g. D. 4.8 g.

14. A tank 2m tall and base area of 2.5m2 is filled to the brim with a liquid, which weighs 40000N. Calculate, the density of the liquid in kg/m3.

A. 4000 2×2.5×10 C. 4000 2×2.5×10

B. 40000 2×2.5×10 D.40000 2×25

PROJECT WORK:

You are required to make a clock for measuring time.

Hint; The simplest clock to make is a water clock using a transparent plastic container with a hole at the bottom.

Steps.

Place a stone in a container to make it float upright.

Put marks on the side as the water rises up.

By Choosing an appropriate container, hole and weight of stone, you can have marks reading 1 minute, 2 minutes, 3 minutes, etc. Even fractions of minutes can be obtained.

You can also make a sand clock using fine dry sand in a container.