**Density – 2019 June**

**1.** 0625/31/M/J/19/No.1

**(a)** A student has a metal object.

**(i)** The student measures the mass of the object.

State the name of the equipment used to measure the mass.

..... [1]

**(ii)** The mass of the metal object is 1260 g. The volume of the metal is 150 $cm^3$.

Calculate the density of the metal. Include the unit.

density = ..... [4]

**(iii)** The mass of the metal object is given in grams. State the mass in kg.

mass = ..... kg [1]

**(b)** A vase is placed on a table. Forces X and Y act on the vase, as shown in Fig. 1.1.

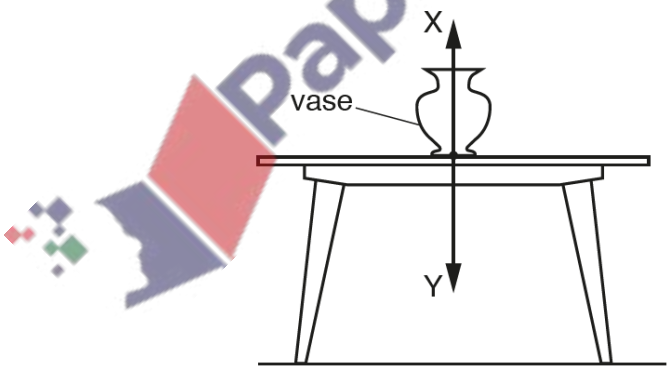


**Fig. 1.1**

The mass of the vase is 0.25 kg. The vase is not moving.

Calculate the value of force X and the value of force Y.

X .....

Y .....

[4]

[Total: 10]

**2.** 0625/32/M/J/19/No.2

A bottle contains some oil.

**(a)** The mass of the oil and the bottle is 678 g. The mass of the empty bottle is 318 g.

Calculate the mass of the oil.

mass = ..... g [1]

**(b)** Some of the oil from **(a)** is poured into measuring cylinder A. The rest of the oil is poured into measuring cylinder B, as shown in Fig. 2.1.

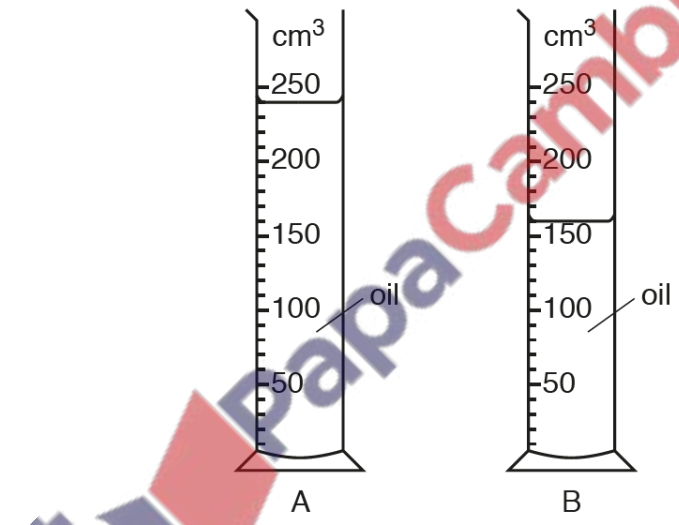


**Fig. 2.1**

**(i)** State the volume of oil in measuring cylinder B, as shown in Fig. 2.1.

volume = ..... $cm^3$ [1]

**(ii)** Calculate the total volume of oil.

volume = ..... $cm^3$ [1]

**(iii)** Calculate the density of the oil.

density = ..... g/cm$^3$ [3]

[Total: 6]

**3.** 0625/33/M/J/19/No.1

Fig. 1.1 shows three metal blocks. Each block has the same mass.

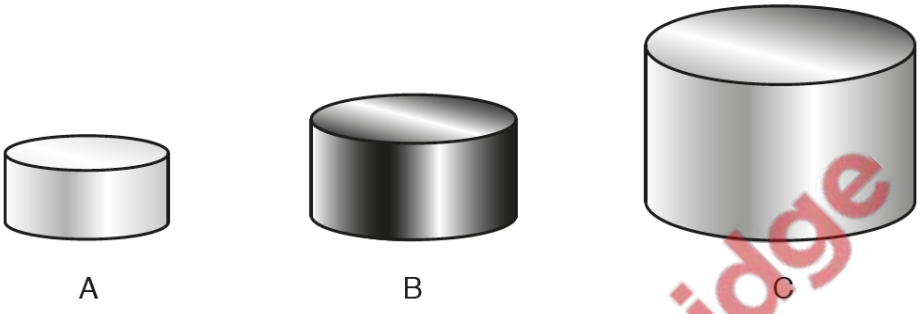


**Fig. 1.1**

The volumes of the blocks are different.

Each block is made of a different metal. The table gives the density of each metal.

| name of metal | density (g/cm$^3$) |
|---|---|
| aluminium | 2.83 |
| iron | 6.95 |
| lead | 11.3 |

**(a)** Use the data from the table to identify the metal used to make each block.

A .....

B .....

C ..... [1]

**(b)** Another metal block is made of brass. Its mass is 200 g.

The density of brass is 8.4 g/cm$^3$.

Calculate the volume of the brass block.

volume = ..... cm$^3$ [3]

**(c)** Describe a method for determining the volume of a small, dense, irregularly-shaped object.

You may draw a labelled diagram.

.....

.....

.....

.....

.....

..... [4]

[Total: 8]

**4.** Fig. 1.1 shows a set of masses made from the same material.

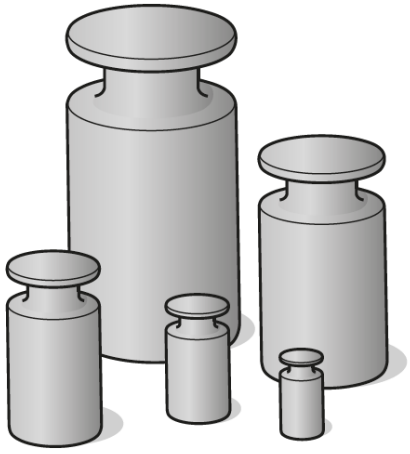

**Fig. 1.1**

**(a)** Identify the quantity that is the same for all the masses.

Tick **one** box.

- ☐ density
- ☐ volume
- ☐ weight [1]

**(b)** The largest mass is 2.5 kg.

State the number of grams in 2.5 kg.

2.5 kg = ..... g [1]

**(c)** The three largest masses are 2.5 kg, 1.0 kg and 0.5 kg.

Calculate the combined **weight** of these three masses. Include the unit.

weight = ..... [4]

[Total: 6]