IGCSE Cambridge Topical Past Papers

PHYSICS

0625 Paper 4

2017 — 2025

1 - (0625/43_Summer_2017_Q3) ANSWER

A block of wood has a volume of 210 cm^3 and a mass of 180 g.

(a) Calculate the density of the block of wood.

density = ...[2]

(b) The block is held just above the surface of a liquid of density 0.88 g/cm^3.

Predict and explain what happens when the block is released.

.....

.....[2]

[Total: 4]

2 - (0625/41_Winter_2017_Q3) ANSWER

All the sides of a plastic cube are 8.0 cm long. Fig. 3.1 shows the cube.

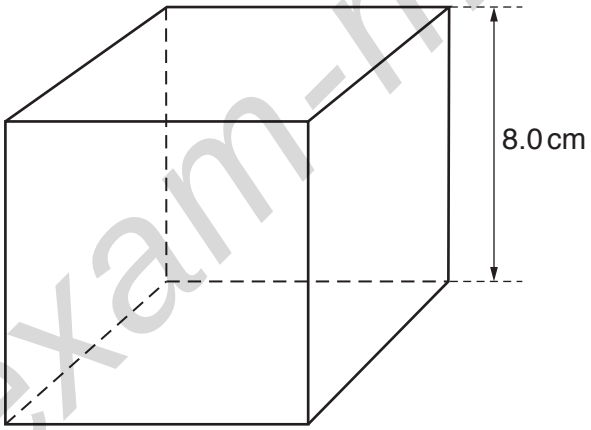

Fig. 3.1 (not to scale)

The mass of the cube is 0.44 kg.

(a) Explain what is meant by *mass*.

.....[1]

(b) **(i)** Calculate the density of the plastic from which the cube is made.

density = ...[2]

(ii) The density of one type of oil is 850 kg/m^3.

State and explain whether the cube floats or sinks when placed in a container of this oil.

.....

.....[1]

(c) On the Moon, the weight of the cube is 0.70 N.

(i) Calculate the gravitational field strength on the Moon.

gravitational field strength = ...[2]

(ii) In a laboratory on the Moon, the plastic cube is held stationary, using a clamp, in a beaker of the oil of density 850 kg / m^3.

The arrangement is shown in Fig. 3.2.

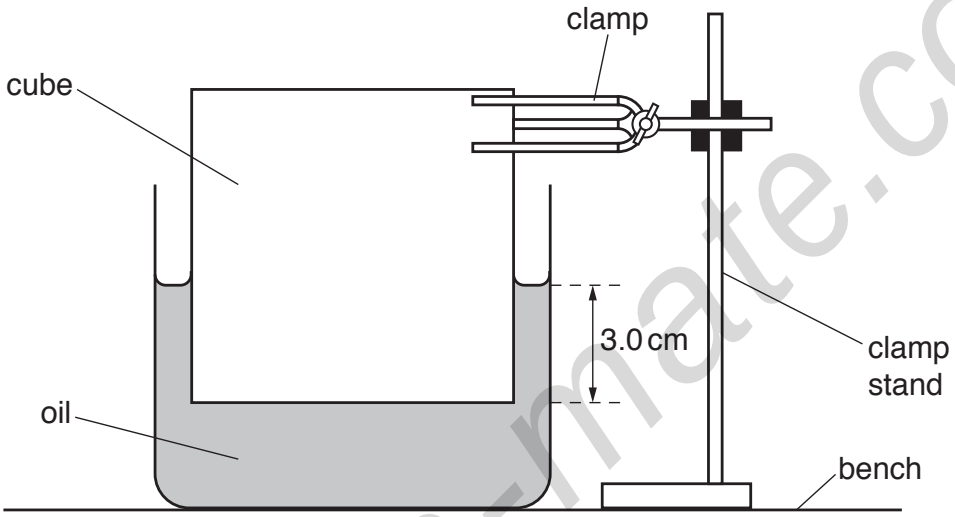

Fig. 3.2

The lower face of the cube is 3.0 cm below the surface of the oil.

Use your answer to **(c)(i)** to calculate the pressure due to the oil on the lower face of the cube.

pressure = ...[2]

[Total: 8]

3 - (0625/42_Winter_2017_Q1) ANSWER

Fig. 1.1 shows a cylinder made from copper of density 9000 kg / m^3.

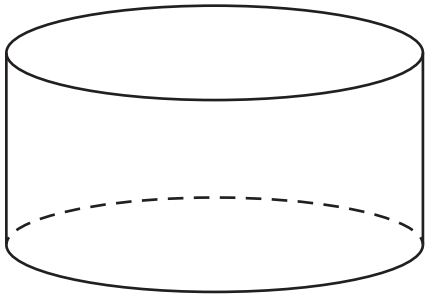

Fig. 1.1

The volume of the cylinder is 75 cm^3.

(a) Calculate the mass of the cylinder.

mass = ...[2]

(b) The gravitational field strength is 10 N / kg.

(i) Calculate the weight of the cylinder.

weight = ...[2]

(ii) State **one** way in which weight differs from mass.

.....

.....

.....[1]

(c) Fig. 1.2 shows the cylinder immersed in a liquid.

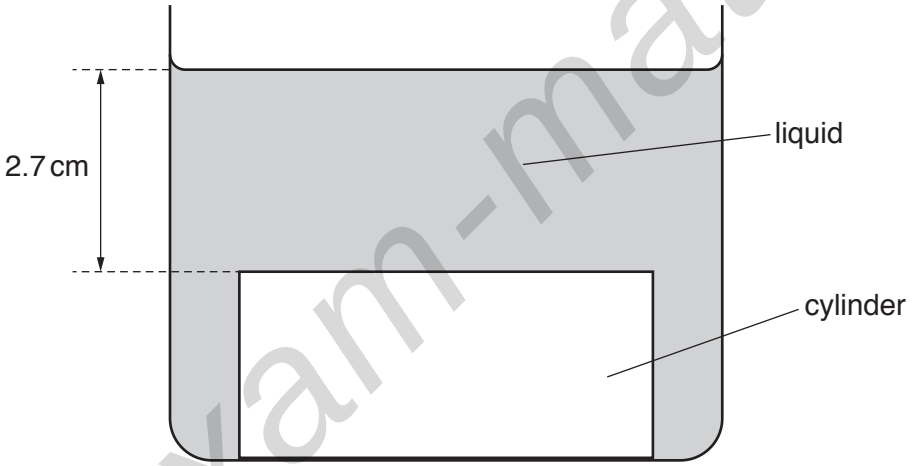

Fig. 1.2 (not to scale)

The upper face of the cylinder is at a depth of 2.7 cm below the surface of the liquid.

The pressure due to the liquid at the upper face of the cylinder is 560 Pa.

(i) Calculate the density of the liquid.

density = ...[2]

(ii) Explain why the cylinder does **not** float in this liquid.

.....

.....[1]

[Total: 8]

4 - (0625/43_Winter_2017_Q2) ANSWER

Fig. 2.1 shows a measuring cylinder that contains a coloured liquid.

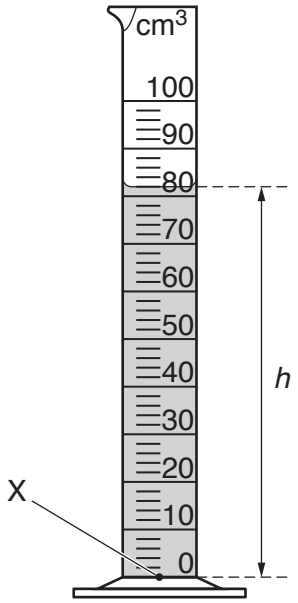

Fig. 2.1

The measuring cylinder contains 82 cm^3 of the liquid. The density of the liquid is 950 kg/m^3.

(a) Calculate the mass of the liquid.

mass = ...[3]

(b) The height *h* of the liquid in the measuring cylinder is 0.094 m.

(i) Calculate the pressure due to the liquid at point X in Fig. 2.1.

pressure = ...[2]

(ii) The true pressure at point X is different from the value calculated in **(b)(i)**. Explain why.

.....

.....[1]

(c) A small object is made of steel. It is placed level with the top surface of the liquid in the measuring cylinder and then released. The object sinks in this liquid.

(i) Explain why the object sinks in this liquid.

.....

.....[1]

(ii) Describe how the volume of the object can now be determined.

.....

.....

.....[1]

[Total: 8]

5 - (0625/41_Summer_2018_Q3) ANSWER

A rectangular container has a base of dimensions 0.12 m × 0.16 m. The container is filled with a liquid. The mass of the liquid in the container is 4.8 kg.

(a) Calculate

(i) the weight of liquid in the container,

weight = ...[1]

(ii) the pressure due to the liquid on the base of the container.

pressure = ...[2]

(b) Explain why the total pressure on the base of the container is greater than the value calculated in **(a)(ii)**.

.....

.....[1]

(c) The depth of liquid in the container is 0.32 m.

Calculate the density of the liquid.

density = ...[2]

[Total: 6]

1 - (0625/43_Summer_2017_Q3) QUESTION

(a)	$(\rho =)\frac{m}{V}$ OR 180 ÷ 210 OR 0.18 ÷ 210	**C1**
	0.86 g / cm^3	**A1**
(b)	floats OR words to the same effect	**B1**
	density of wood is less than density of liquid	**B1**
	Total:	**4**

2 - (0625/41_Winter_2017_Q3) QUESTION

(a)	(Measure of) quantity / amount of matter OR (property) that resists change in motion / speed / momentum OR measure of a body's inertia	**B1**
(b)(i)	$d = m / V$ OR in words OR 0.44 / 0.080^3 OR 0.44 / 5.12×10^{-4} OR 440 / 8^3 OR 440 / 512 OR 0.44 / 8^3 OR 0.44 / 512	**C1**
	0.86 g / cm^3 OR 860 kg / m^3 OR 8.6×10^{-4} kg / cm^3	**A1**
(b)(ii)	Sinks OR does not float AND (cube) denser (than oil)	**B1**
(c)(i)	$W = mg$ OR (g =) W / m OR 0.70 / 0.44	**C1**
	1.6 N / kg	**A1**
(c)(ii)	(P =) hdg OR $0.030 \times 850 \times 1.6$	**C1**
	41 Pa	**A1**

3 - (0625/42_Winter_2017_Q1) QUESTION

(a)	$\rho = m / V$ in any form OR (m =) ρV OR *(m =)* $9000 \times 7.5 \times 10^{-5}$	**C1**
	(m =) 0.68 kg **accept** 680 g	**A1**
(b)(i)	$W = m g$ in any form or (W =) $m g$ OR (W =) 0.68×10	**C1**
	(W =) 6.8 N	**A1**
(b)(ii)	any **one** of: weight has direction / mass does not weight is a vector / mass is not weight varies / mass does not mass is amount of matter weight is a force / mass is not	**B1**
(c)(i)	$\rho = h \rho g$ in any form OR (ρ =) $\rho / h g$ OR (ρ =) 560 / (0.027 × 10)	**C1**
	(ρ =) 2.1×10^3 kg / m^3	**A1**
(c)(ii)	explains why there is a resultant downward force	**B1**

4 - (0625/43_Winter_2017_Q2)

(a)	(m =)ρV **or** $950 \times 8.2 \times 10^{-5}$ **or** 0.95×82	**C1**
	$7.8 / 7.79 \times 10^{N}$ (where N is a integer)	**C1**
	0.078 / 0.0779 kg **or** 78 / 77.9 g	**A1**
(b)(i)	(p =)$h\rho g$ **or** $0.094 \times 950 \times 10$	**C1**
	890 / 893 Pa	**A1**
(b)(ii)	atmospheric pressure (is acting)	**B1**
(c)(i)	steel is denser (than liquid) **or** denser than 950 kg / m^3	**B1**
(c)(ii)	take new reading **and** subtract 82 (cm^3) / original reading	**B1**

5 - (0625/41_Summer_2018_Q3)

(a)(i)	W = (4.8 × 10 =) 48 N	**1**
(a)(ii)	(P =) F ÷ A OR 48 ÷ (0.12 × 0.16)	**1**
	2500 Pa	**1**
(b)	Atmospheric pressure (in addition to liquid pressure)	**1**
(c)	P = hdg or in words OR (d =) P ÷ hg OR 2500 ÷ (0.32 × 10)	**1**
	780 kg / m^3	**1**
	OR d = M ÷ V = 4.8 ÷ (0.12 × 0.16 × 0.32)	**(1)**
	780 kg / m^3	**(1)**