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SMART EXAM RESOURCES
SUBJECT:COORDINATED SCIENCES [PHYSICS]
PAPER 4
TOPIC: MOTION
SUB-TOPIC: DENSITY/MASS/VOLUME
SET 4 QP-MS

1 The volume of the ethanol in the thermometer at 25 °C is 2.00 cm^3 and the density of the ethanol is 0.78 g/cm^3.

When the thermometer is cooled to 3 °C, the volume decreases to 1.95 cm^3.

Calculate the density of the ethanol at 3 °C.

density of ethanol = ... g/cm^3 [3]

MARK SCHEME:

(m =) ρ × V OR 0.78 × 2.0 OR 1.56 (g) ; (ρ =) m / V OR 1.56 / 1.95 ; (ρ =) 0.80 (g / cm^3) ;	**3**

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2 Fig. 6.1 shows a marble staircase made up of 17 steps.

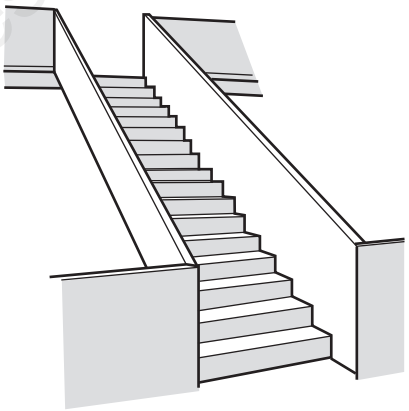

Fig. 6.1

(a) Fig. 6.2 shows the dimensions of one of the marble steps which has a mass of 72 kg.

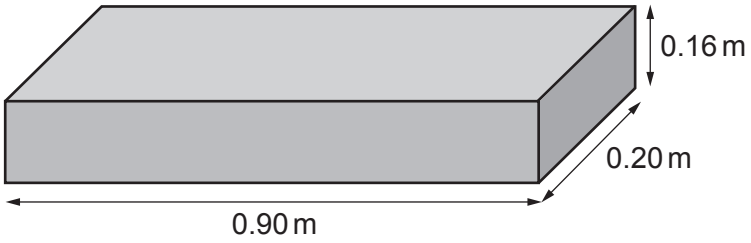

Fig. 6.2

(i) Calculate the density of the marble step.

density = ... kg / m^3 [3]

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MARK SCHEME:

Question	Answer	Marks
(a)(i)	(V =) 0.16 × 0.20 × 0.90 or 0.0288 (m^3) ; (ρ =) m / V or 72 / 0.0288 ; 2500 (kg / m^3) ;	3

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3 Fig. 12.3 shows the dimensions of the glass block.

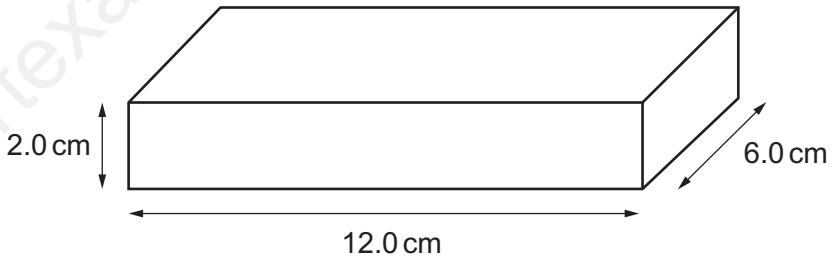

Fig. 12.3

The density of glass is 2.80 g / cm^3.

Use Fig. 12.3 to calculate the mass of the glass block.

mass = ... g [3]

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MARK SCHEME:

	(volume =) 144 (cm^3) ; (mass =) 2.8(0) × 144 ; (mass =) 403 (g) ;	**3**

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4 The volume of the container is $0.050\,m^3$.

The density of the radon gas is $9.7\,kg/m^3$.

Calculate the weight of the radon gas in the container.

The gravitational field strength, g, is $10\,N/kg$.

weight = ... N [3]

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MARK SCHEME:

(m =) ρV ; (m = 9.7 × 0.05) 0.485 (kg) ; ($W = mg$ = 0.485 × 10 =) 4.9 (N) ;	**3**

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5 When the meteoroid lands on Earth, it is called a meteorite.

A small meteorite has a mass of 1720 g and a volume of 200 cm^3.

Calculate the density of the meteorite.

density = ... g/cm^3 [2]

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MARK SCHEME:

	(density =) mass / volume or 1720 / 200 (*in any form*) ; 8.6(0) (g / cm^3) ;	**2**

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