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IGCSE PHYSICS 0625 · TOPICAL PAST PAPERS

Mass, Weight & Density

Paper 1 — Multiple-Choice Questions (topical compilation)

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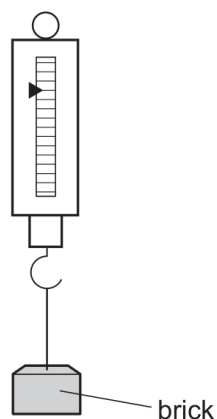
MASS, WEIGHT, AND DENSITY

PAPER 1 QUESTIONS

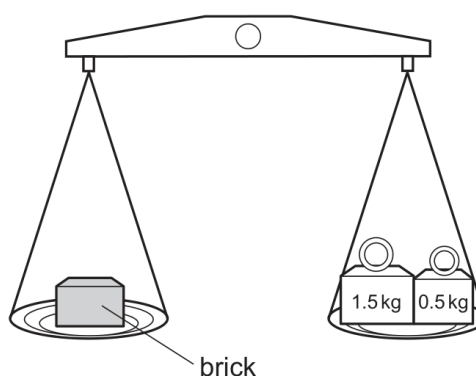
QUESTION # 1: M/J 16 P11 Q7

- 7 A brick is placed on a newton meter and then on a beam balance.

newton meter



beam balance



What is measured by each instrument?

	newton meter	beam balance
A	mass	mass
B	mass	weight
C	weight	mass
D	weight	weight

QUESTION # 2: M/J 17 P11 Q10

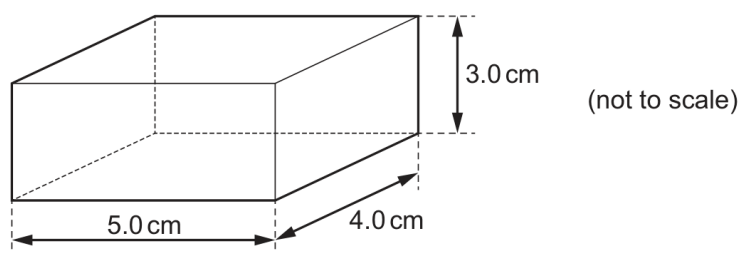
10 An astronaut travels to the International Space Station.

Which row describes how his mass and his weight compare with their sizes on Earth?

	mass	weight
A	different	different
B	different	the same
C	the same	different
D	the same	the same

QUESTION # 3: M/J 17 P12 Q11

11 The diagram shows a rectangular block.



The density of the block is 2.5 g/cm^3 .

What is the mass of the block?

- A** 18 g **B** 24 g **C** 50 g **D** 150 g

QUESTION # 4: M/J 18 P11 Q6

6 Which piece of equipment is used to measure mass?

- A** balance
B manometer
C measuring cylinder
D newton meter

QUESTION # 5: M/J 18 P11 Q7

- 7 A body of mass 10 kg falling freely in the gravitational field close to the Moon's surface has an acceleration of 1.6 m/s^2 .

What is the gravitational field strength on the Moon?

- A** 0 N/kg **B** 1.6 N/kg **C** 10 N/kg **D** 16 N/kg

QUESTION # 8: M/J 18 P12 Q8

- 8 A block of metal is placed on an electronic balance to record its mass.



What is the unit of the reading on the electronic balance and what is the unit of weight?

	unit on electronic balance	unit of weight
A	g	g
B	g	N
C	N	g
D	N	N

QUESTION # 9: M/J 19 P11 Q8

- 8 Four objects of different masses are situated in places with different gravitational field strengths.

Which object has the greatest weight?

	mass / kg	<u>gravitational field strength</u> N/kg
A	3.0	10.4
B	3.5	9.5
C	4.0	10.2
D	4.5	9.0

QUESTION # 10: M/J 20 P11 Q9

- 9 Four objects of different masses are on different planets.

The weight of each object on its planet is determined.

Which object is on the planet with the smallest gravitational field strength?

	mass / kg	weight / N
A	5	125
B	15	150
C	20	220
D	25	225

QUESTION # 11: M/J 20 P11 Q10

- 10 Which physical quantity does **not** change when a piece of copper is heated?

- A** density
- B** mass
- C** temperature
- D** volume

QUESTION # 12: M/J 20 P11 Q11

- 11 A single metal bolt has a mass of 34 g.

Three of the bolts are immersed in a measuring cylinder that contains 30 cm³ of water.

The reading on the measuring cylinder rises to 42 cm³.

What is the density of the metal?

- A** 0.81 g/cm³ **B** 2.8 g/cm³ **C** 7.5 g/cm³ **D** 8.5 g/cm³

QUESTION # 13: M/J 20 P12 Q9

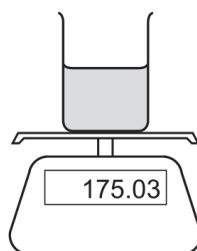
- 9 An object weighs 40 N on Earth, where the gravitational field strength is 10 N/kg. The object is taken to a planet where the gravitational field strength is 4.0 N/kg.

Which row is correct?

	mass of object on the planet / kg	weight of object on the planet / N
A	4.0	1.0
B	4.0	16
C	400	100
D	400	1600

QUESTION # 14: M/J 20 P12 Q10

- 10 The diagram shows the equipment used to determine the density of a liquid.



Which equation is used to calculate the density of the liquid?

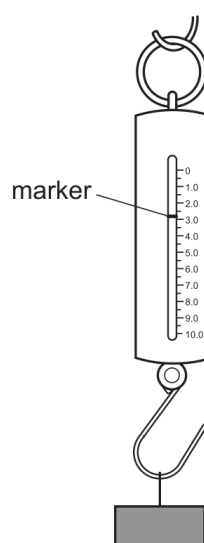
- A $\frac{\text{mass of beaker and liquid} - \text{mass of beaker}}{\text{volume of liquid}}$
- B $\frac{\text{mass of beaker and liquid} - \text{mass of liquid}}{\text{volume of liquid}}$
- C $\frac{\text{volume of liquid}}{\text{mass of beaker and liquid} - \text{mass of beaker}}$
- D $\frac{\text{volume of liquid}}{\text{mass of beaker and liquid} - \text{mass of liquid}}$

QUESTION # 15: O/N 16 P11 Q5

- 5 Which statement about mass and weight is correct?
- A A mass experiences a weight due to a gravitational field.
 - B Mass and weight are different types of force.
 - C Mass and weight have the same unit.
 - D When an object expands, its mass changes but its weight stays the same.

QUESTION # 16: O/N 16 P12 Q7

- 7 A block is hung on a spring balance. The marker inside the balance is pulled down by the block.



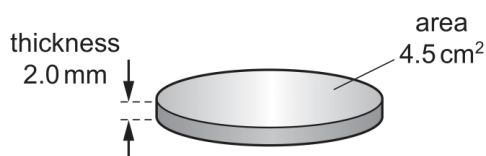
What can the position of the marker be used to determine?

- A the mass of the block in kg
- B the mass of the block in N
- C the moment caused by the block in N m
- D the weight of the block in kg

QUESTION # 17: O/N 16 P12 Q8

- 8 The density of gold is 19 g/cm^3 .

A gold coin is 2.0 mm thick. Each face of the coin has an area of 4.5 cm^2 .

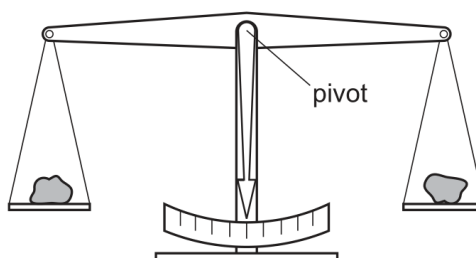


What is the mass of the coin?

- A 2.1 g B 17 g C 21 g D 170 g

QUESTION # 18: O/N 17 P11 Q6

- 6 The diagram shows two objects on a beam balance.



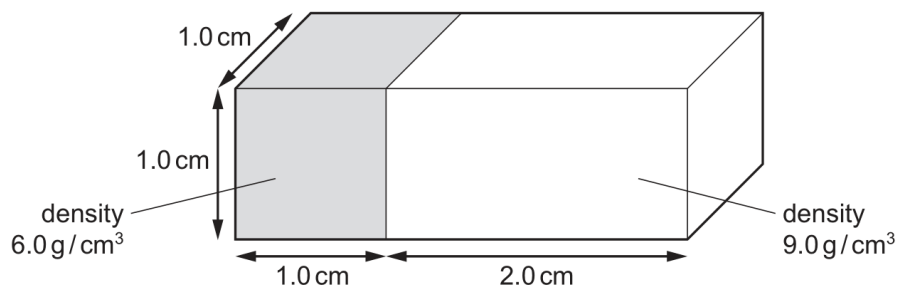
The beam balance is in equilibrium.

Which quantities may be different?

- A the masses of the two objects
B the moments about the pivot of the two objects
C the volumes of the two objects
D the weights of the two objects

QUESTION # 19: O/N 17 P12 Q6

- 6 Two blocks are joined together.



One block has a density of 6.0 g/cm³ and the other has a density of 9.0 g/cm³.

What is the overall density of the two blocks joined together?

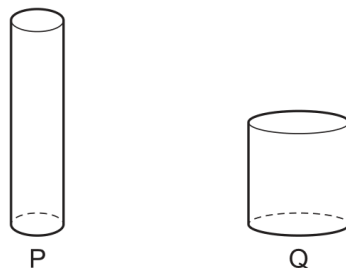
- A** 7.0 g/cm³ **B** 7.5 g/cm³ **C** 8.0 g/cm³ **D** 15 g/cm³

QUESTION # 20: O/N 18 P11 Q6

- 6 What happens to an object when it is moved to a location where the gravitational field strength is slightly greater?
- A** Its density decreases.
B Its mass decreases.
C Its weight increases.
D Its volume increases.

QUESTION # 21: O/N 18 P11 Q7

- 7 Two cylinders P and Q are made of copper.



The height of P is twice the height of Q. The diameter of P is half the diameter of Q.

Which statement is correct?

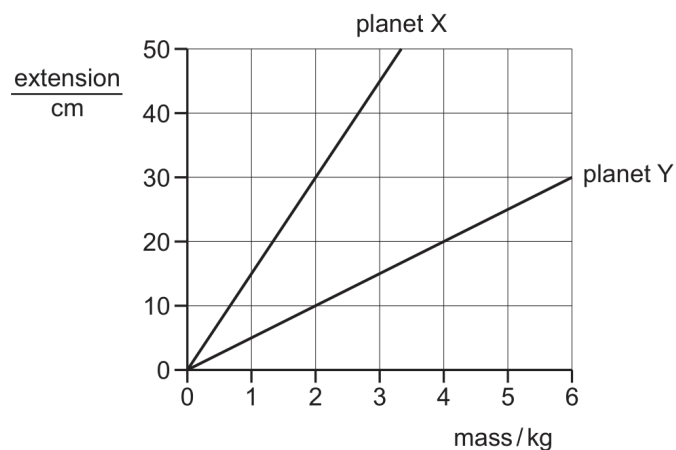
- A The density of cylinder P is four times that of cylinder Q.
- B The density of cylinder P is twice that of cylinder Q.
- C The density of cylinder P is equal to that of cylinder Q.
- D The density of cylinder P is half that of cylinder Q.

QUESTION # 22: O/N 18 P12 Q5

- 5 Which piece of apparatus may be used to compare the masses of two objects?
- A balance
 - B manometer
 - C measuring cylinder
 - D micrometer

QUESTION # 23: O/N 18 P12 Q6

- 6 The graph shows how the extension of a spring changes with the masses suspended from it when the spring is on planet X and when the spring is on planet Y.

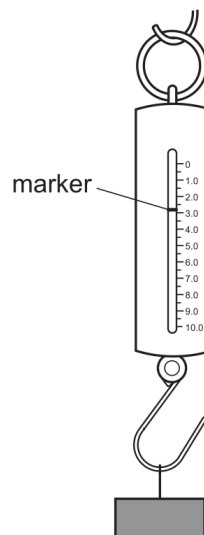


Which conclusion can be drawn from these graphs?

- A It is not possible to compare the gravitational field strengths on planets X and Y.
- B The gravitational field strength on planet X is equal to the gravitational field strength on planet Y.
- C The gravitational field strength on planet X is one third of the gravitational field strength on planet Y.
- D The gravitational field strength on planet X is three times the gravitational field strength on planet Y.

QUESTION # 24: O/N 20 P11 Q6

- 6 A block is hung on a spring balance. The marker inside the balance is pulled down by the block.



What can the position of the marker be used to determine?

- A the mass of the block in kg
- B the mass of the block in N
- C the moment caused by the block in N
- D the weight of the block in kg

QUESTION # 25: O/N 20 P11 Q7

- 7 An electrically charged plastic ball is at rest.

Which types of field are caused by the ball?

- A electric, gravitational and magnetic
- B electric and gravitational only
- C electric and magnetic only
- D gravitational and magnetic only

QUESTION # 26: O/N 20 P11 Q8

- 8 Which statement about mass and weight is correct?
- A Mass is a scientific term that means the same as weight.
 - B The mass of an object on Earth is 10 times its weight.
 - C Weight is a scalar quantity, mass is a vector quantity.
 - D Weight is the force of gravity pulling on a mass.

QUESTION # 27: O/N 20 P11 Q9

- 9 Which expression is used to calculate density?
- A $\text{mass} \times \text{volume}$
 - B $\frac{\text{mass}}{\text{volume}}$
 - C $\text{volume} + \text{mass}$
 - D $\frac{\text{volume}}{\text{mass}}$

QUESTION # 28: O/N 20 P12 Q8

- 8 There is an astronaut on a planet which has a gravitational field strength one fifth of the value on Earth.

He hangs samples of rock from a spring balance designed for use on Earth. Each sample has a mass of 0.1 kg.

The spring balance reads 1.0 kg.

How many samples of rock are there?

- A 2 B 10 C 25 D 50