CAMBRIDGE IGCSE PHYSICS · 0625

PHYSICS



EXAM QUESTION PACK

TOPIC 1: MOTION, FORCES AND ENERGY

SCORE	PERCENTAGE
/	%

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Motion

Question Paper 2

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Motion
Booklet	Question Paper 2

Time allowed: **20 minutes**

Score: **/16**

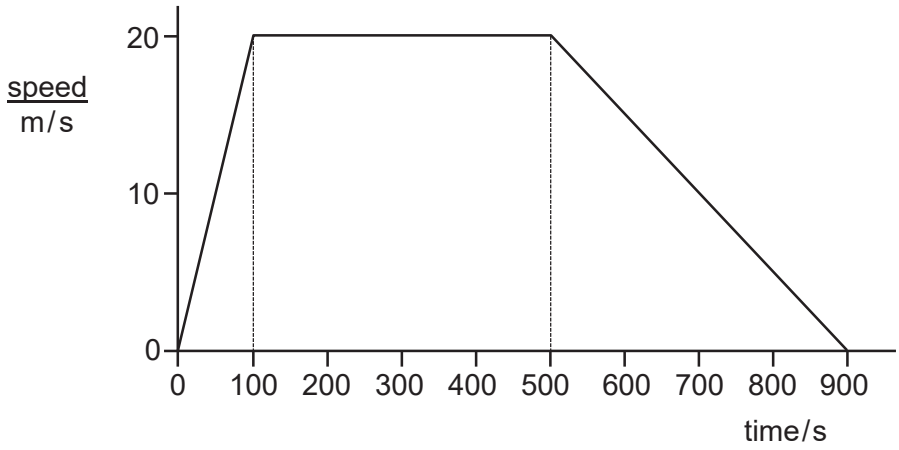
Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

Question 1

The graph represents the motion of a train travelling between two stations.



Which statement about the train is correct?

A. Its acceleration takes a longer time than its deceleration.

B. It travels at constant speed for less than half of its journey time.

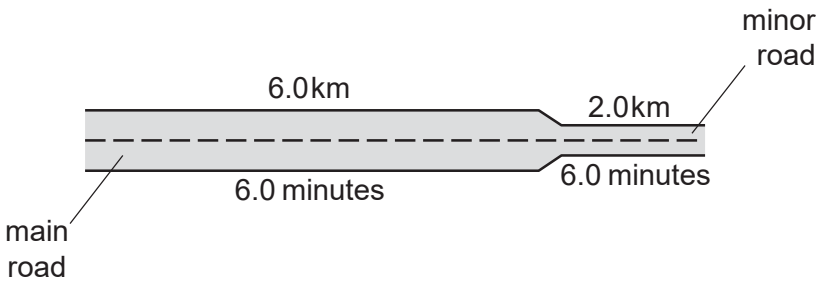
C. It travels 2000 m in the first 100 s.

D. It travels 10 000 m at constant speed.

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Question 2

A car travels 6.0 km along a main road in 6.0 minutes. It then travels 2.0 km along a minor road in 6.0 minutes.



Which calculation of average speed for the whole journey is correct?

A 8.0 ÷ 12.0 = 0.67 km / minute

B 12.0 ÷ 8.0 = 1.5 km / minute

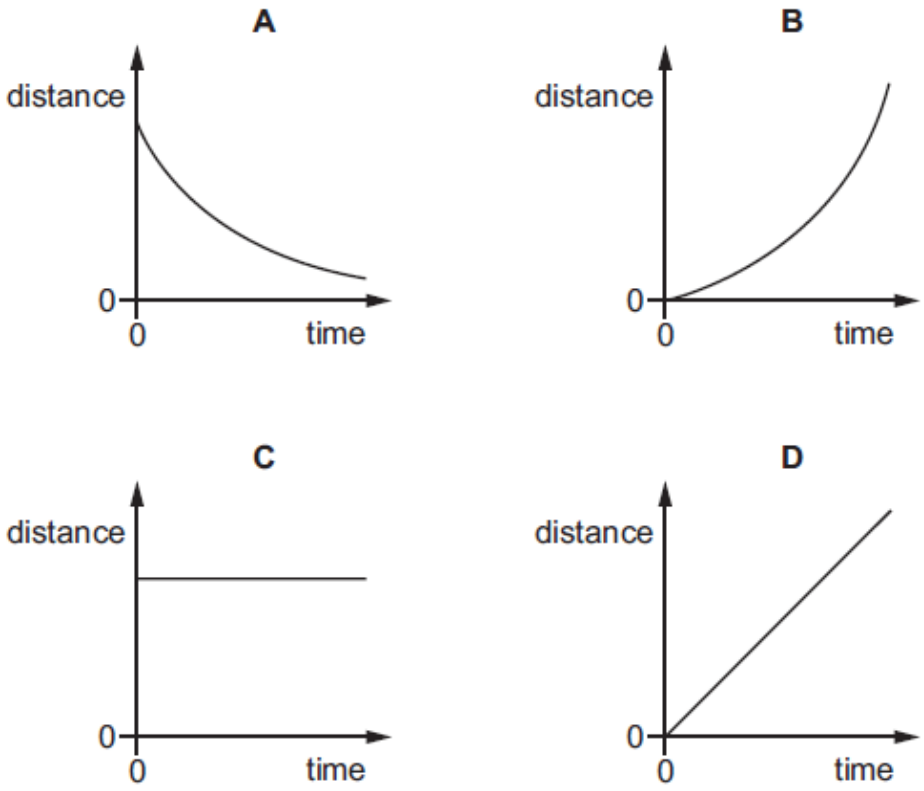
C 8.0 + 12.0 = 20 km / minute

D 8.0 × 12.0 = 96 km / minute

.

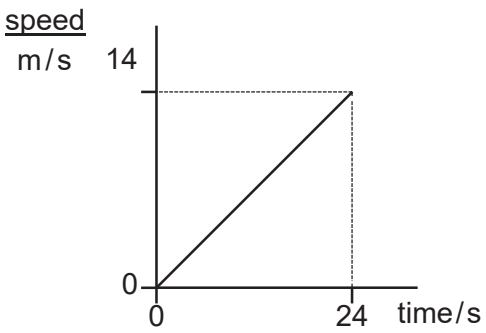
Question 3

Which distance / time graph represents the motion of an object moving at constant speed?



Question 4

The graph shows how the speed of a car changes with time.



Which calculation gives the distance travelled by the car in 24 seconds?

A $\left(\frac{14}{24}\right)$m

B $\left(\frac{24}{14}\right)$m

C $\left(\frac{24\times14}{2}\right)$m

D (24×14)m

Question 5

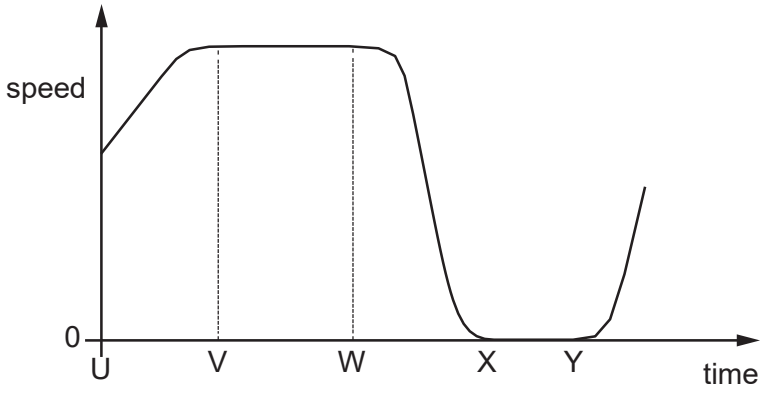
A car takes 15 minutes to travel along a road that is 20 km long.

What is the average speed of the car?

A 0.75 km/h B 5.0 km/h C 80 km/h D 300 km/h

Question 6

The graph shows how the speed of a car changes with time.



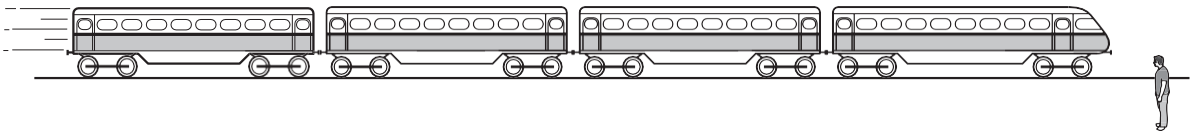
Between which two times is the car stationary?

A U and V B V and W C W and X D X and Y

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Question 7

A man stands by a railway track.



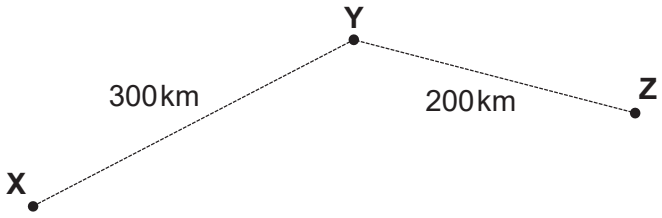
A train travelling at 40 m / s takes 2.0 s to pass the man.

What is the length of the train?

A 20 m B 38 m C 40 m D 80 m

Question 8

An aeroplane flies from town **X** to town **Z**, stopping for 1 hour at town **Y** to pick up more passengers. The distances between the towns are shown in the diagram.



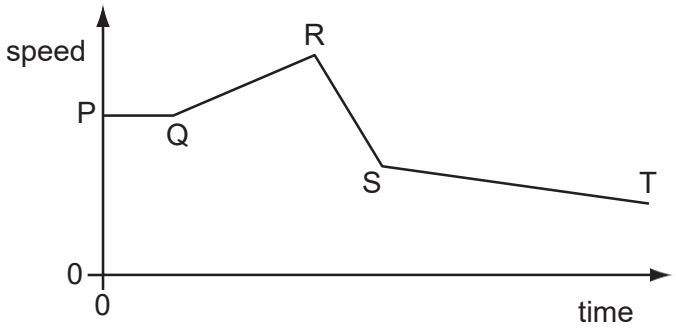
The total time taken between leaving **X** and arriving at **Z** is 3 hours.

What is the average speed of the aeroplane **in the air**?

A $\frac{500}{4}$ km / h B $\frac{500}{3}$ km / h C $\frac{500}{2}$ km / h D $\frac{500}{1}$ km / h

Question 9

The diagram shows the speed / time graph for a train as it travels along a track.



For which part of the graph is the train's speed changing at the greatest rate?

A PQ B QR C RS D ST

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Question 10

A small steel ball is dropped from a low balcony.

Ignoring air resistance, which statement describes its motion?

A. It falls with constant acceleration.

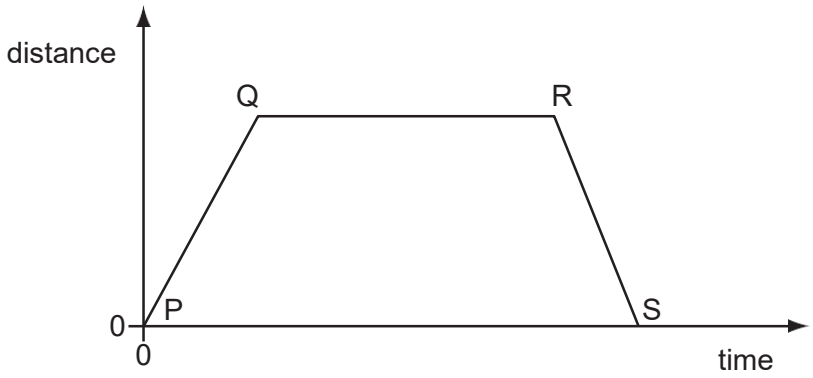
B. It falls with constant speed.

C. It falls with decreasing speed.

D. It falls with increasing acceleration.

Question 11

The graph shows how the distance travelled by a vehicle changes with time.



Which row describes the speed of the vehicle in each section of the graph?

	P to Q	Q to R	R to S
A	constant	zero	constant
B	constant	zero	decreasing
C	increasing	constant	decreasing
D	increasing	zero	decreasing

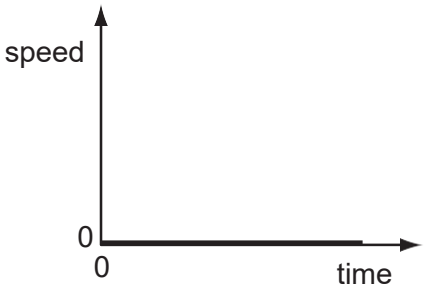
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Question 12

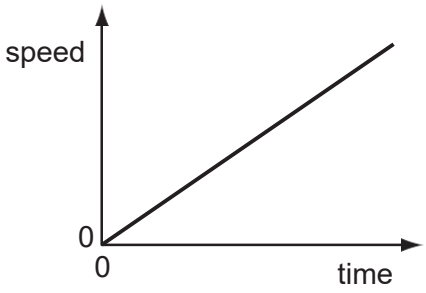
A car is moving downhill along a road at a constant speed.

Which graph is the speed / time graph for the car?

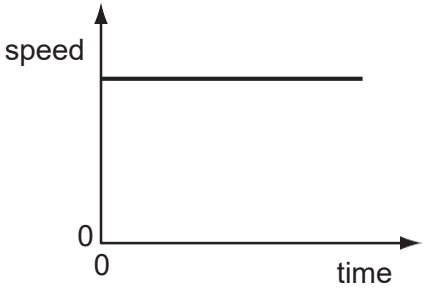
A



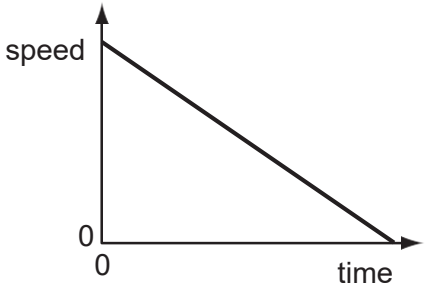
B



C



D



Question 13

In a race, a car travels 60 times around a 3.6 km track. This takes 2.4 hours.

What is the average speed of the car?

A 1.5 km/h B 90 km/h C 144 km/h D 216 km/h

Question 14

A tennis player hits a ball hard and 0.40 s later hears the echo from a wall.



The speed of sound in air is 330 m / s.

How far away is the player from the wall?

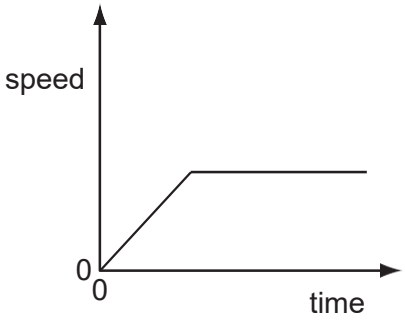
A 66 m B 132 m C 264 m D 825 m

Question 15

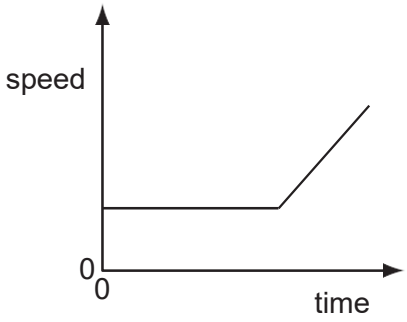
An object moves initially with constant speed and then with constant acceleration.

Which graph shows this motion?

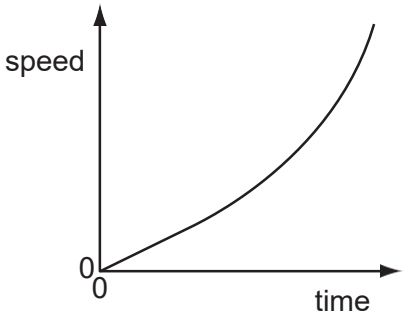
A



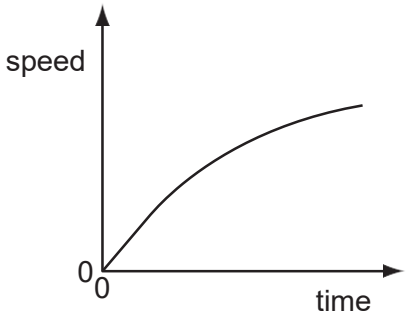
B



C

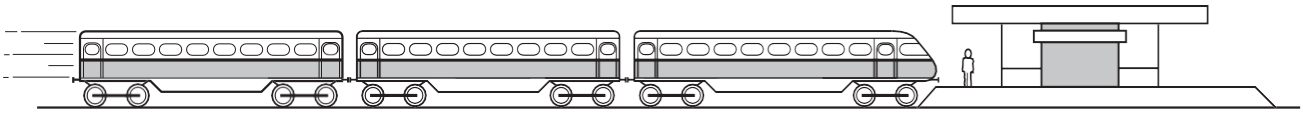


D



Question 16

A child is standing on the platform of a station.



A train travelling at 30 m / s takes 3.0 s to pass the child.

What is the length of the train?

A 10 m B 27 m C 30 m D 90 m

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Mass & Weight

Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Mass & Weight
Booklet	Question Paper 1

Time allowed: **18 minutes**

Score: **/14**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

Question 1

A cup contains hot liquid.

Some of the liquid evaporates.

What happens to the mass and what happens to the weight of the liquid in the cup?

	mass	weight
A	decreases	decreases
B	decreases	stays the same
C	stays the same	decreases
D	stays the same	stays the same

Question 2

An astronaut in an orbiting spacecraft experiences a force due to gravity. This force is less than when she is on the Earth's surface.

Compared with being on the Earth's surface, how do her mass and her weight change when she goes into orbit?

	mass in orbit	weight in orbit
A	decreases	decreases
B	decreases	unchanged
C	unchanged	decreases
D	unchanged	unchanged

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Question 3

Diagram 1 shows a piece of foam rubber that contains many pockets of air. Diagram 2 shows the same piece of foam rubber after it has been compressed so that its volume decreases.

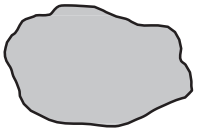


diagram 1
(before compression)

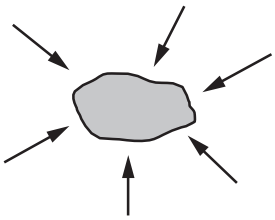


diagram 2
(after compression)

What happens to the mass and to the weight of the foam rubber when it is compressed?

	mass	weight
A	increases	increases
B	increases	no change
C	no change	increases
D	no change	no change

Question 4

Weight is an example of which quantity?

A. acceleration

B. force

C. mass

D. pressure

Question 5

The mass of an object is measured on Earth. The mass is 5.0 kg.

The object is taken to the Moon. The mass of the object is measured on the Moon.

What is the mass of the object on the Moon?

A. 0 kg

B. more than 0 kg, but less than 5.0 kg

C. 5.0 kg

D. more than 5.0 kg

Question 6

Which statement about mass or weight is correct?

A. Mass is a force.

B. Mass is measured in newtons.

C. Weight is a force.

D. Weight is measured in kilograms.

Question 7

What is the weight of an object?

A. the force of gravity on the object

B. the gravitational potential energy of the object

C. the internal energy of the object

D. the mass of the object

Question 8

Which instrument is used to compare the masses of objects?

A. a balance

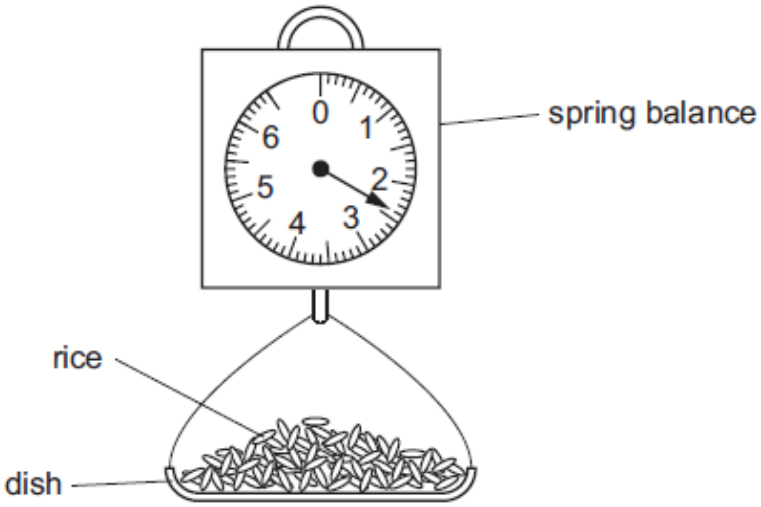
B. a barometer

C. a manometer

D. a measuring cylinder

Question 9

A customer goes to a market and buys some rice. The stallholder pours rice into a dish that hangs from a spring balance. He records the reading on the spring balance.



The customer then buys some pasta and the stallholder notices that the reading on the spring balance, with just pasta in the dish, is the same as it was with just rice in the dish.

The rice and the pasta must have the same

A. density.

B. temperature.

C. volume.

D. weight.

Question 10

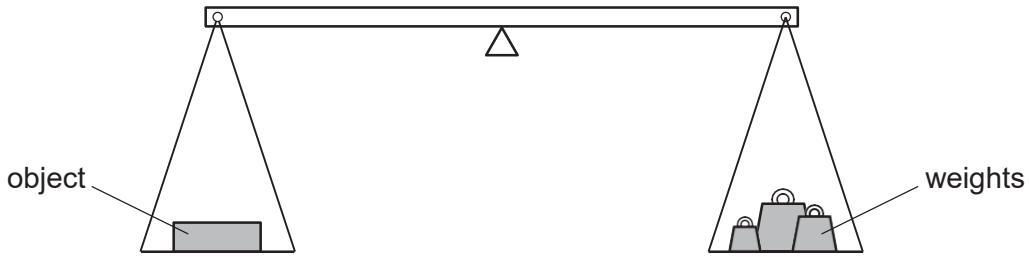
The mass of an astronaut is 70kg on the Moon.

What is the mass of the astronaut on the Earth?

A 7kg B 70kg C 80kg D 700kg

Question 11

The weight of an object is found using the balance shown in the diagram. The object is put in the left-hand pan and various weights are put in the right-hand pan.



These are the results.

weights in the right-hand pan	effect
0.1 N, 0.1 N, 0.05 N, 0.02 N	balance tips down slightly on the left-hand side
0.2 N, 0.1 N, 0.01 N	balance tips down slightly on the right-hand side

What is the best estimate of the weight of the object?

A 0.27 N B 0.29 N C 0.31 N D 0.58 N

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Question 12

Which is the unit for force and which is the unit for weight?

	force	weight
A	kg	kg
B	kg	N
C	N	kg
D	N	N

Question 13

Which quantity is measured in newtons?

A. density

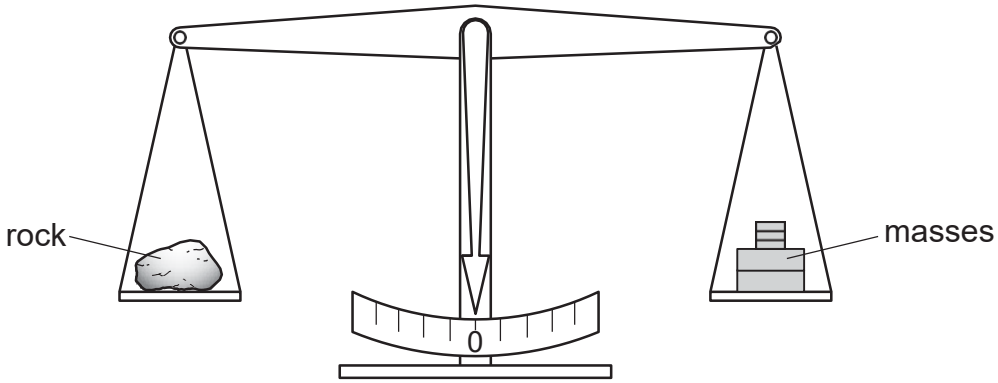
B. energy

C. pressure

D. Weight.

Question 14

A geologist places a small rock on the left-hand pan of a balance. The two pans are level as shown when masses with a total weight of 23 N are placed on the right-hand pan. Take the weight of 1.0 kg to be 10 N.



What is the mass of the small rock?

A 0.023 kg B 2.3 kg C 23 kg D 230 kg

Density

Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Density
Booklet	Question Paper 1

Time allowed: **20 minutes**

Score: **/16**

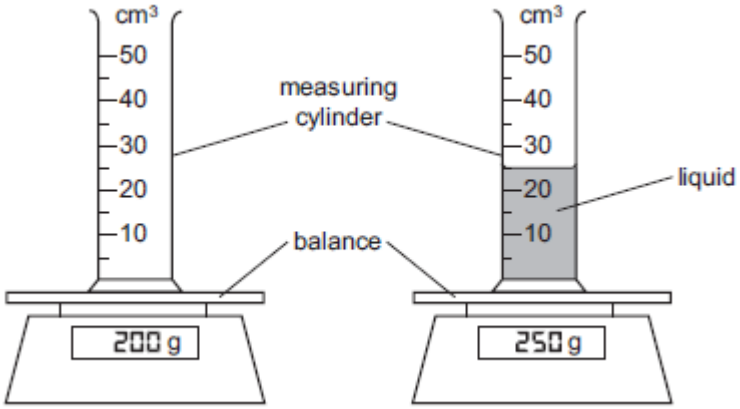
Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

Question 1

The diagram shows an experiment to find the density of a liquid.

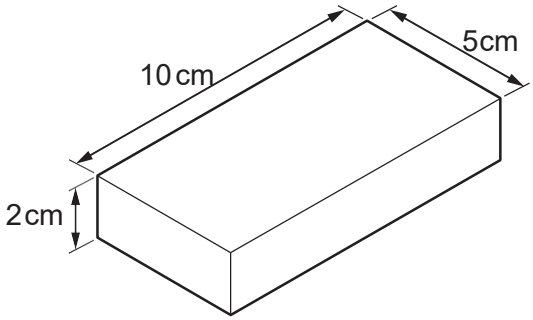


What is the density of the liquid?

A $0.5\,g/cm^3$ B $2.0\,g/cm^3$ C $8.0\,g/cm^3$ D $10.0\,g/cm^3$

Question 2

A metal block has the dimensions shown. Its mass is 1000 g.



What is the density of the metal?

A $\left(\frac{5\times10}{1000\times2}\right)$ g/cm^3

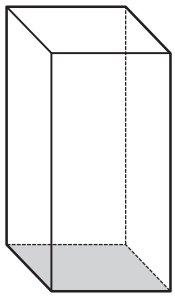
B $\left(\frac{2\times5\times10}{1000}\right)$ g/cm^3

C $\left(\frac{1000\times2}{5\times10}\right)$ g/cm^3

D $\left(\frac{1000}{2\times5\times10}\right)$ g/cm^3

Question 3

A student wishes to determine the density of the solid block shown.



Which quantities must be known?

A the area of the shaded face and the volume of the block

B the area of the shaded face and the weight of the block

C the mass of the block and the height of the block

D the mass of the block and the volume of the block

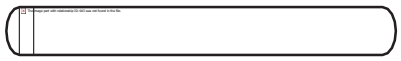
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Question 4

Two cylinders are made of the same metal. Both cylinders have the same cross-sectional area but one is longer than the other.



cylinder 1



cylinder 2

Which quantity is the same for both cylinders?

A. density

B. mass

C. resistance

D. volume

Question 5

The mass of a piece of metal is 1200 g.

A measuring cylinder contains 150 cm^3 of water.

The piece of metal is put into the measuring cylinder. The water level rises to 250 cm^3 and covers the metal.

What is the density of the metal?

A $3.0\,g/cm^3$ B $4.8\,g/cm^3$ C $8.0\,g/cm^3$ D $12.0\,g/cm^3$

Question 6

A person measures the length, width, height and mass of a metal block with rectangular sides.

Which of these measurements must be used in order to calculate the density of the metal?

A. mass only

B. height and mass only

C. length, width and height only

D. length, width, height and mass

Question 7

A liquid has a volume of 100 cm^3 and a mass of 85g.

The density of water is $1.0\,g/cm^3$.

How does the density of the liquid compare with the density of water?

A Its density is higher than that of water.

B Its density is lower than that of water.

C Its density is the same as that of water.

D It is impossible to say with only this data.

Question 8

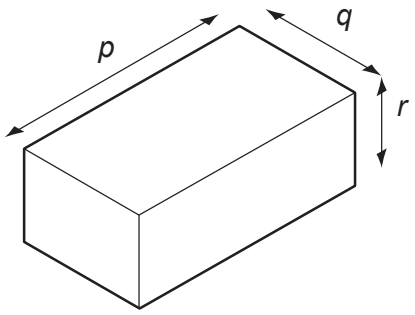
The table gives the volumes and masses of four objects.

Which object has the greatest density?

	mass / g	volume / cm^3
A	5.4	2.0
B	13	3.0
C	15	6.0
D	18	5.0

Question 9

The diagram shows the dimensions of a rectangular block of metal of mass m.



Which expression is used to calculate the density of the metal?

A. $m \times p \times q$

B. $m \times p \times q \times r$

C $\dfrac{m}{(p \times q)}$

D $\dfrac{m}{(p \times q \times r)}$

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Question 10

Diagram 1 shows an empty measuring cylinder on a balance.

Diagram 2 shows the same measuring cylinder on the balance, but it now contains a liquid.

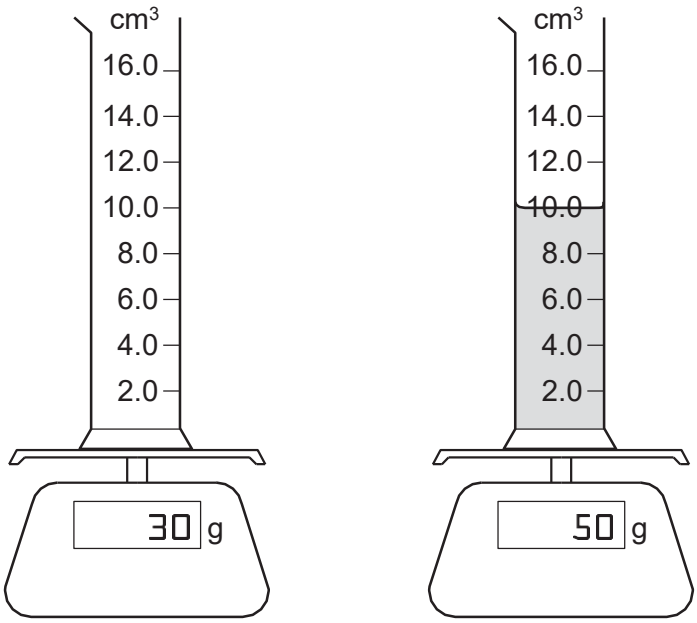


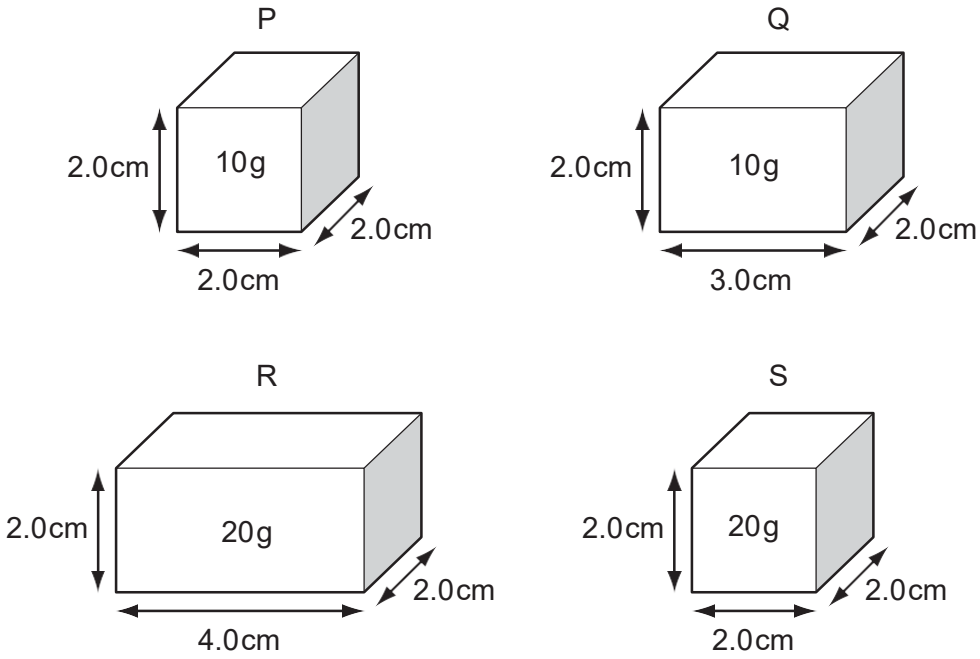
diagram 1 diagram 2

What is the density of the liquid?

A $0.2\,g/cm^3$ B $0.5\,g/cm^3$ C $2.0\,g/cm^3$ D $5.0\,g/cm^3$

Question 11

Four rectangular blocks, P, Q, R and S are shown. Each block is labelled with its size and its mass.



Which two blocks have the same density?

A P and Q B P and R C Q and R D R and S

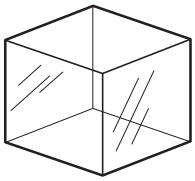
Question 12

A student is given four different objects and a metre rule.
Each object has a known mass. She is asked to determine the densities of the materials from which the four objects are made.

The objects are a copper cylinder, a glass cube, a steel spanner and a stone tile.



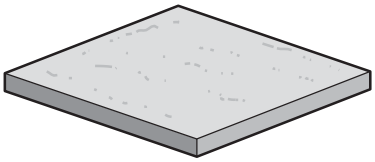
copper



glass



steel



stone

Using only the metre rule, she is able to find the densities of only three of the four materials.

Which three materials are these?

A copper, glass and steel

B copper, glass and stone

C copper, steel and stone

D glass, steel and stone

Question 13

A stone has a volume of $0.50\,cm^3$ and a mass of $2.0\,g$.

What is the density of the stone?

A $0.25\,g/cm^3$

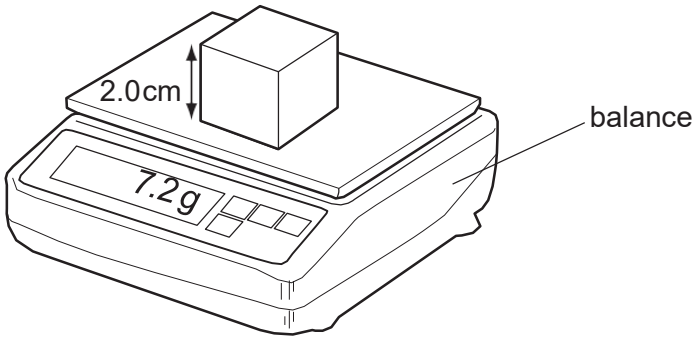
B $1.5\ g\ /\ cm^3$

C $2.5\ g\ /\ cm^3$

D $4.0\,g/cm^3$

Question 14

A cube of side 2.0cm is placed on a balance.



What is the density of the cube?

A $0.90\,g/cm^3$ B $1.2\,g/cm^3$ C $1.8\,g/cm^3$ D $3.6\,g/cm^3$

Question 15

A student is told to measure the density of a liquid and also of a large cube of metal.

Which pieces of equipment are sufficient to be able to take the measurements needed?

A. balance, measuring cylinder and ruler

B. balance and thermometer

C. measuring cylinder and ruler

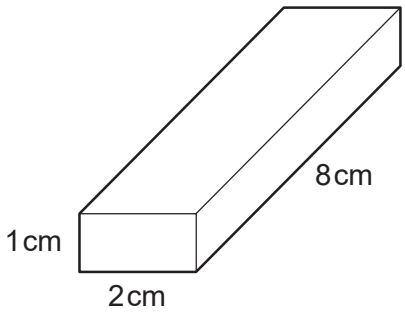
D. measuring cylinder, ruler and thermometer

Question 16

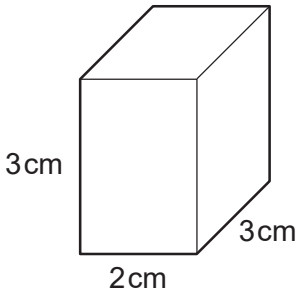
The diagrams show four blocks with the same mass.

Which block is made from the least dense material?

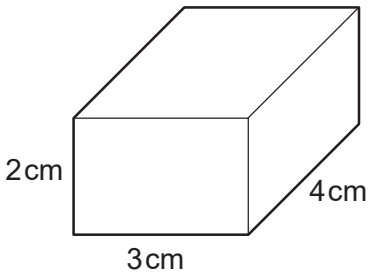
A



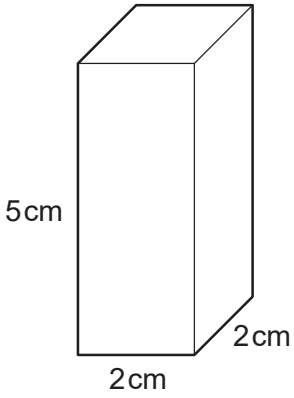
B



C



D



Moments / Centre of Mass

Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Moments / Centre of Mass
Booklet	Question Paper 1

Time allowed: **19 minutes**

Score: **/15**

Percentage: **/100**

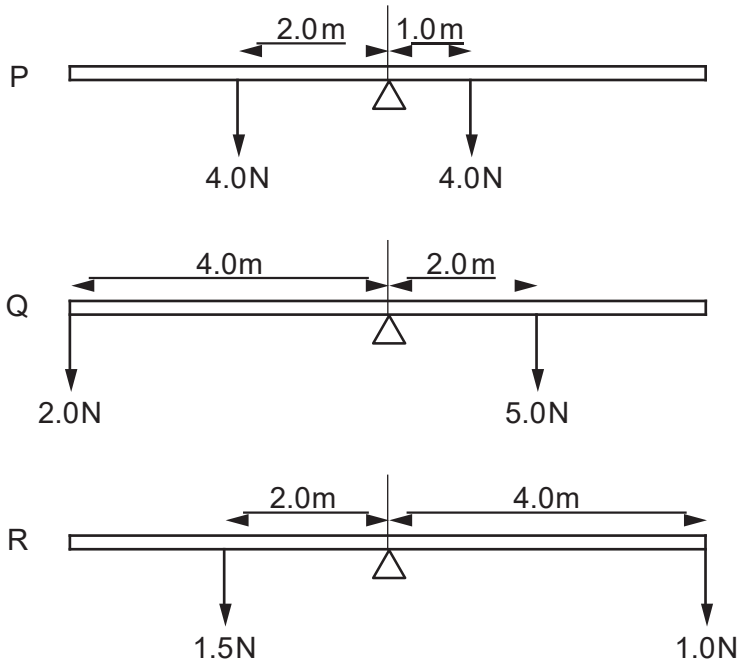
Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

Question 1

The diagrams show three uniform beams P, Q and R, each pivoted at its centre.

The two forces acting on each beam are also shown.



Which beams rotate clockwise?

A. P and Q only

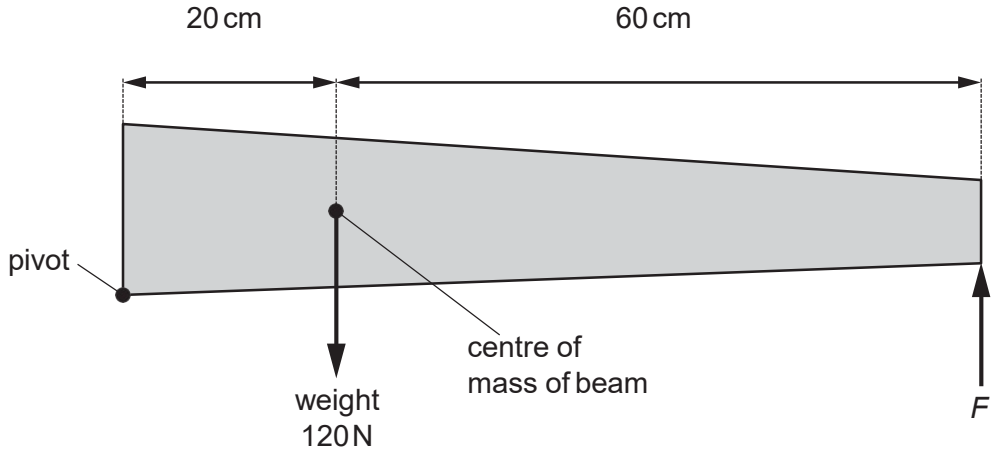
B. P and R only

C. Q and R only

D. P, Q and R

Question 2

The diagram shows a non-uniform beam of weight 120 N, pivoted at one end. The beam is kept in equilibrium by force *F*.



What is the value of force *F*?

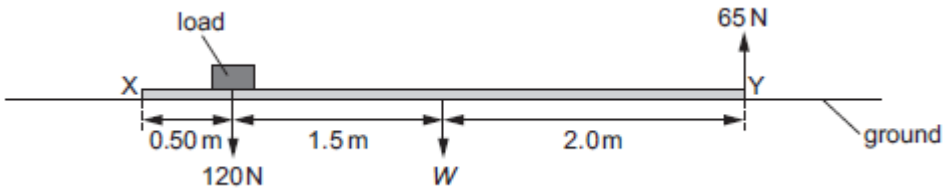
A 30 N B 40 N C 360 N D 480 N

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Question 3

A long plank XY lies on the ground. A load of 120 N is placed on it, at a distance of 0.50 m from end X, as shown.

End Y is lifted off the ground. The upward force needed to do this is 65 N.



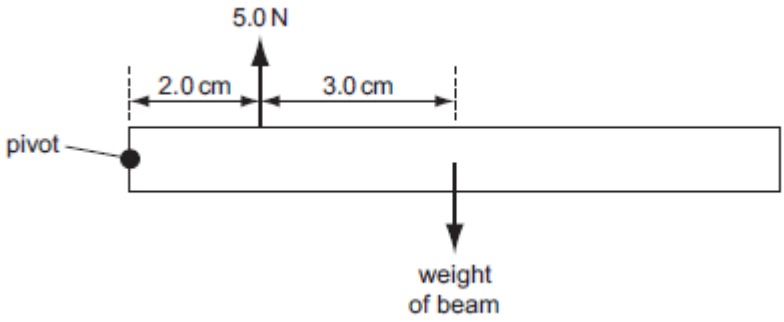
In the diagram, *W* is the weight of the plank, acting at its mid-point.

What is the value of *W*?

A 35 N B 47 N C 100 N D 133 N

Question 4

A beam pivoted at one end has a force of 5.0 N acting vertically upwards on it as shown. The beam is in equilibrium.



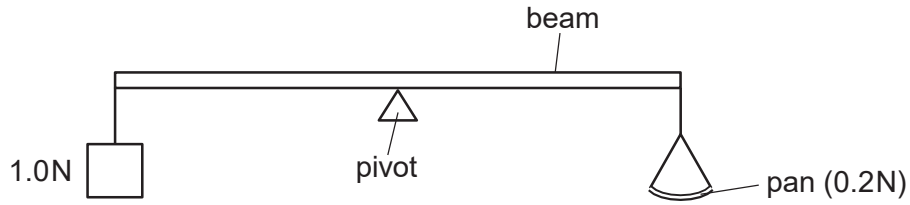
What is the weight of the beam?

A 2.0 N B 3.0 N C 3.3 N D 5.0 N

Question 5

The diagram shows a uniform beam being used as a balance. The beam is pivoted at its centre.

A 1.0 N weight is attached to one end of the beam. An empty pan weighing 0.2 N is attached to the other end of the beam.

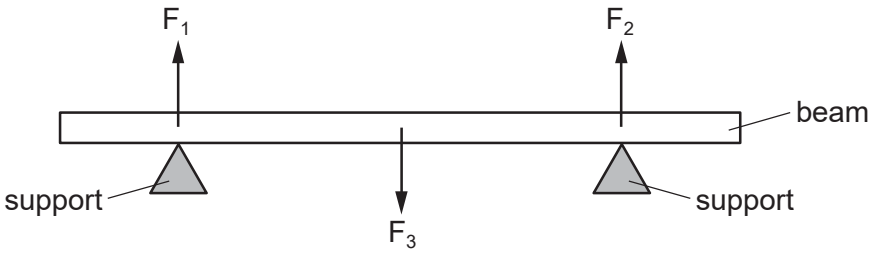


How many 0.1 N weights must be placed on the pan in order to balance the beam?

A 5 B 8 C 10 D 12

Question 6

A heavy beam rests on two supports. The diagram shows the only three forces F_1, F_2 and F_3 acting on the beam.



The beam is in equilibrium.

Which statement is correct?

A. All the forces are equal in size.

B. The resultant force on the beam is in the opposite direction to the resultant turning effect.

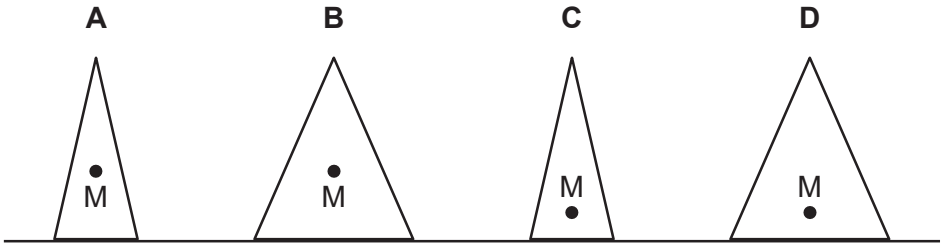
C. The resultant force on the beam is zero and the resultant turning effect on the beam is zero.

D. The total upward force is twice the total downward force.

Question 7

The diagrams show four solid cones. The centre of mass of each cone is marked by a point labelled M.

Which cone is the most stable?



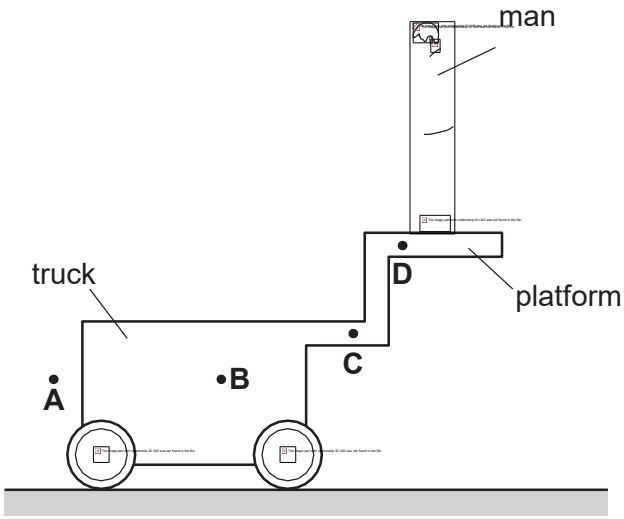
Question 8

A heavy truck on wheels has a platform attached to it.

A man stands on the platform.

The truck does not fall over.

Which position **A, B, C** or **D** could be the centre of mass of the whole system (truck, platform and man)?



Question 9

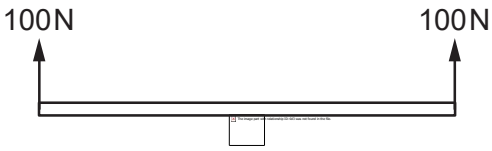
A uniform rod rests on a pivot at its centre. The rod is not attached to the pivot. Forces are then applied to the rod in four different ways, as shown. The weight of the rod can be ignored.

Which diagram shows the rod in equilibrium?

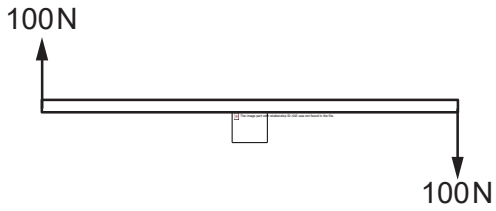
A



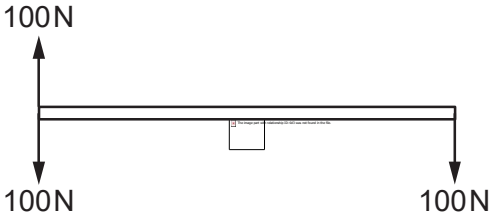
B



C



D

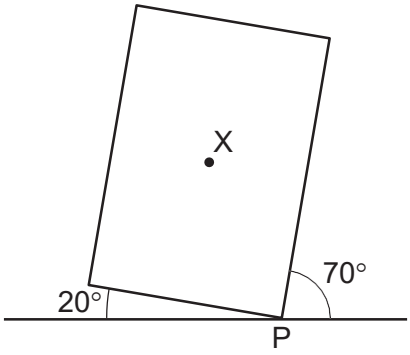


Question 10

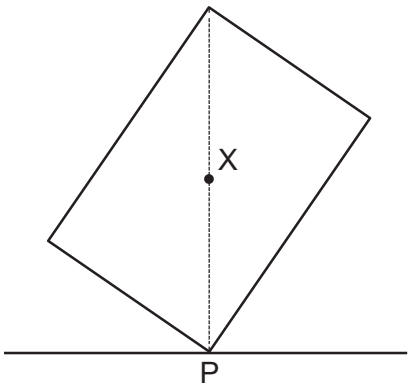
A plane lamina with cent

Which diagram shows the lamina in equilibrium?

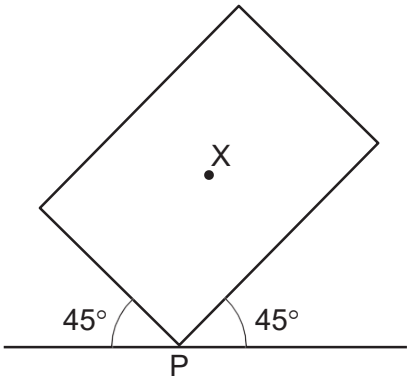
A



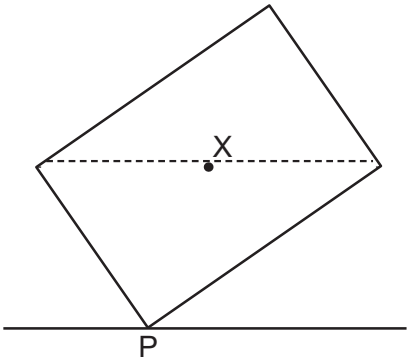
B



C



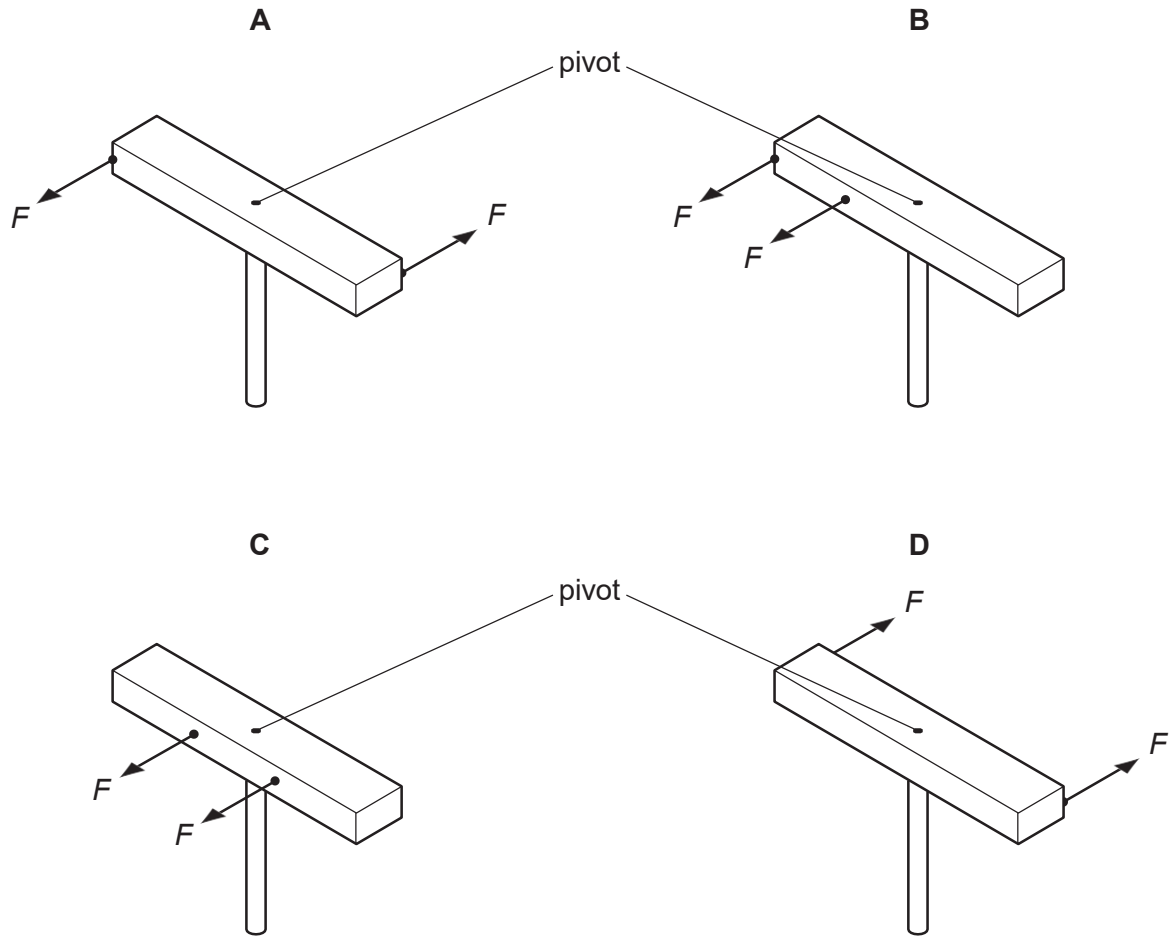
D



Question 11

A wooden bar is pivoted at its centre so that it can rotate freely. Two equal forces *F* are applied to the bar.

In which diagram is the turning effect greatest?

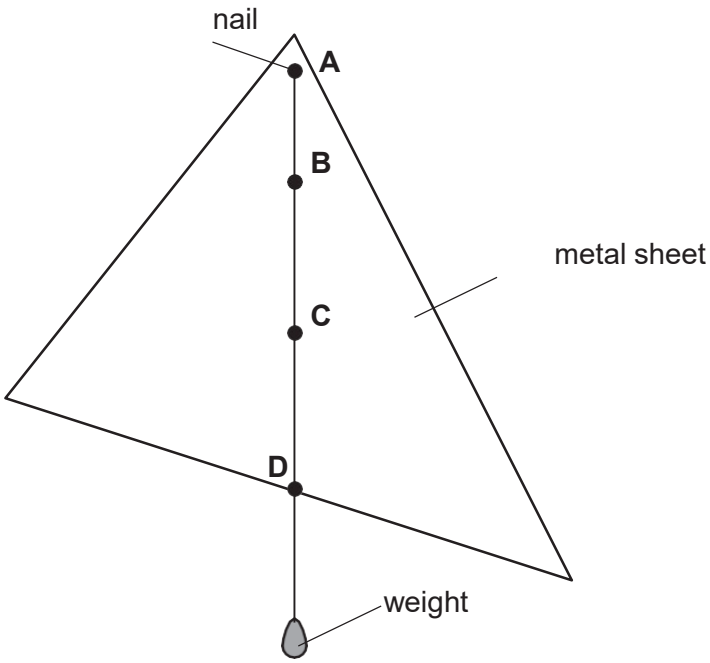


Question 12

The diagram shows a uniform, flat metal sheet hanging freely from a nail at point **A**. A weight also hangs freely on a string tied to **A.**

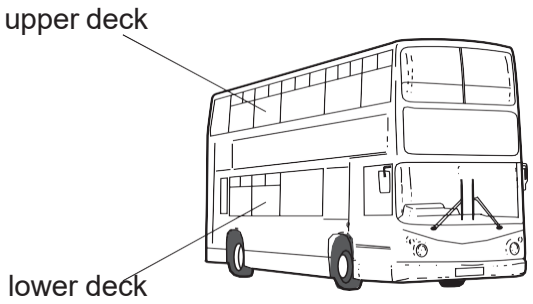
One of the labelled points is at the centre of mass of the metal sheet.

Which point is at the centre of mass?



Question 13

Passengers are not allowed to stand on the upper deck of double-decker buses.



Why is this?

A. They would cause the bus to become less stable.

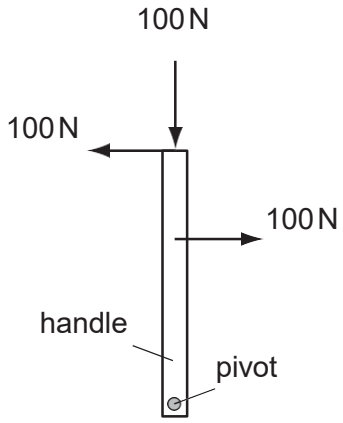
B. They would cause the bus to slow down.

C. They would increase the kinetic energy of the bus.

D. They would lower the centre of mass of the bus.

Question 14

The diagram shows a handle with three forces, each 100 N, applied to it. The handle is free to move.



What is the effect of the forces on the handle?

A. The handle will move downwards.

B. The handle will not move.

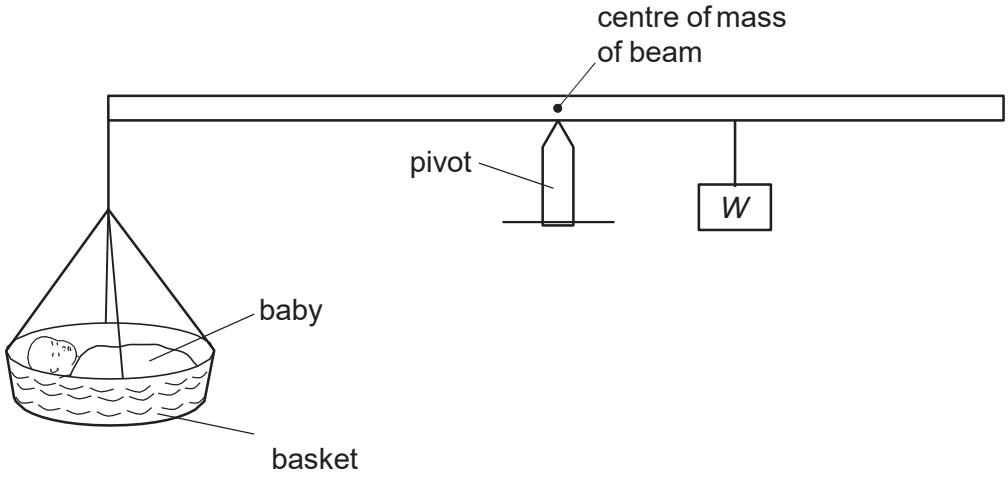
C. The handle will turn anticlockwise (to the left).

D. The handle will turn clockwise (to the right).

Question 15

The diagram shows a balance being used to find the weight of a baby. The weight of the basket can be ignored.

At equilibrium, the pivot is nearer to the weight W than to the baby.



What is the weight of the baby?

A less than W

B more than W

C W

D impossible to tell

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Energy, Work & Power

Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Energy, Work & Power
Booklet	Question Paper 1

Time allowed: **21 minutes**

Score: **/17**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

Question 1

A lorry of mass 4000 kg is travelling at a speed of 4.0 m / s.

A car has a mass of 1000 kg. The kinetic energy of the car is equal to the kinetic energy of the lorry.

What is the speed of the car?

A 2.0 m/s B 4.0 m/s C 8.0 m/s D 16.0 m/s

Question 2

A force acts on an object and causes the object to move a certain distance, in the same direction as the force.

Which row represents a situation in which the largest amount of work is done on the object by the force?

	force / N	distance moved / m
A	2.0	40.0
B	10.0	2.0
C	20.0	6.0
D	100.0	1.0

Question 3

A stone of mass m is held at rest in water. The stone is released and falls vertically a distance h. The stone reaches a speed v.

Some of the original energy of the stone is transferred to the water. As it falls, resistive forces cause the temperature of the water and stone to increase.

Which expression gives the work done against the resistive forces?

A $\frac{1}{2}mv^2$

B $mgh - \frac{1}{2}mv^2$

C mgh

D $mgh + \frac{1}{2}mv^2$

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Question 4

Which energy resource does not derive its energy from the Sun?

A geothermal

B hydroelectric

C oil

D waves

Question 5

Some processes are more efficient than others.

Which expression gives the efficiency of a process?

A $\frac{\text{total energy output}}{\text{total energy input}} \times 100\%$

B $\frac{\text{useful energy output}}{\text{total energy input}} \times 100\%$

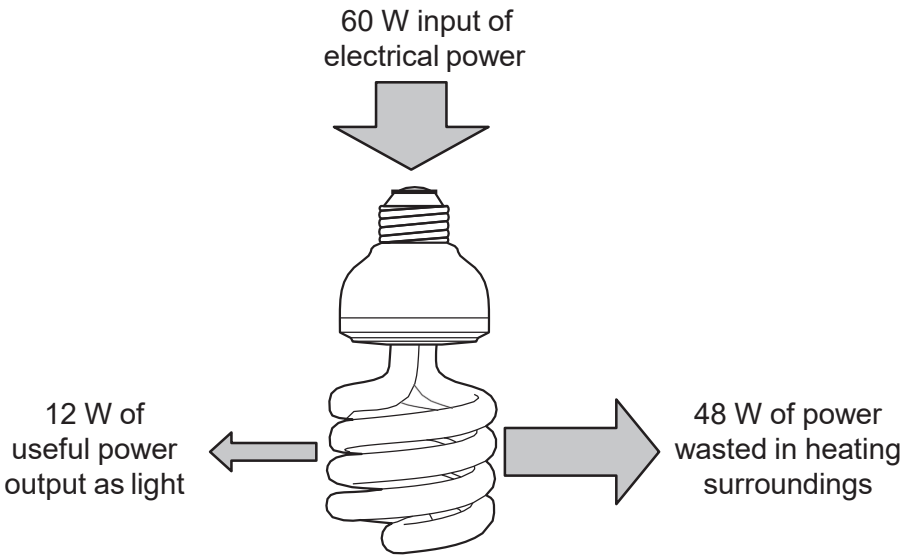
C $\frac{\text{wasted energy output}}{\text{total energy input}} \times 100\%$

D $\frac{\text{wasted energy output}}{\text{useful energy output}} \times 100\%$

.

Question 6

The diagram shows the energy used by a modern lamp.



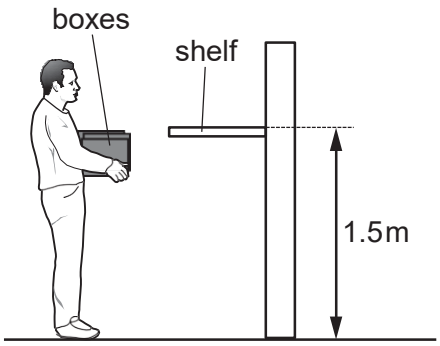
Which expression gives the efficiency of the lamp?

A $\frac{12}{60} \times 100\%$ B $\frac{12}{48} \times 100\%$ C $\frac{48}{60} \times 100\%$ D $\frac{48}{12} \times 100\%$

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Question 7

Three boxes each weigh 100 N. A man lifts all the boxes together from the ground on to a shelf that is 1.5 m above the ground. The man takes 2.0 s to do this.



How much useful power does the man produce to lift the boxes?

A 75 W B 225 W C 300 W D 900 W

Question 8

A car has a mass of 1000 kg and a momentum of 12000 kg m/s.

What is its kinetic energy?

A. 6 kJ

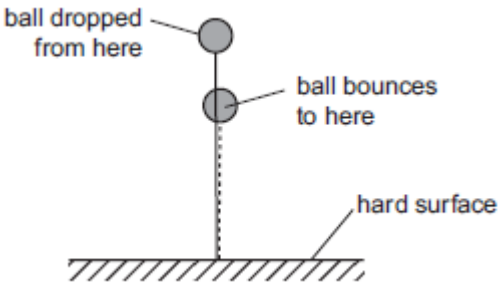
B. 12 kJ

C. 72 kJ

D. 144 kJ

Question 9

A ball is dropped on to a hard surface and bounces. It does not bounce all the way back to where it started, and so has not regained all of its original gravitational potential energy.



Which statement accounts for the loss of gravitational potential energy?

A. Energy was destroyed as the ball hit the ground.

B. Energy was destroyed as the ball travelled through the air.

C. The chemical energy and elastic energy of the ball have increased.

D. The internal (heat) energy of the ball and its surroundings has increased.

Question 10

Which energy resource is used to generate electricity without using any moving parts?

A geothermal

B hydroelectric

C nuclear

D solar

Question 11

A cyclist travels down a hill from rest at point X, without pedalling.

The cyclist applies his brakes and the cycle stops at point Y.



Which energy changes have taken place between X and Y?

A gravitational potential → kinetic → thermal (heat)

B gravitational potential → thermal (heat) → kinetic

C kinetic → gravitational potential → thermal (heat)

D kinetic → thermal (heat) → gravitational potential

Question 12

Which source of energy involves the splitting of heavy atoms?

A. chemical energy

B. geothermal energy

C. hydroelectric energy

D. nuclear energy

Question 13

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	X
C	X	✓
D	X	X

key

✓ = needed

X = not needed

Question 14

Electrical energy may be obtained from nuclear fission.

In which order is the energy transferred in this process?

A nuclear fuel → generator → reactor and boiler → turbines

B nuclear fuel → generator → turbines → reactor and boiler

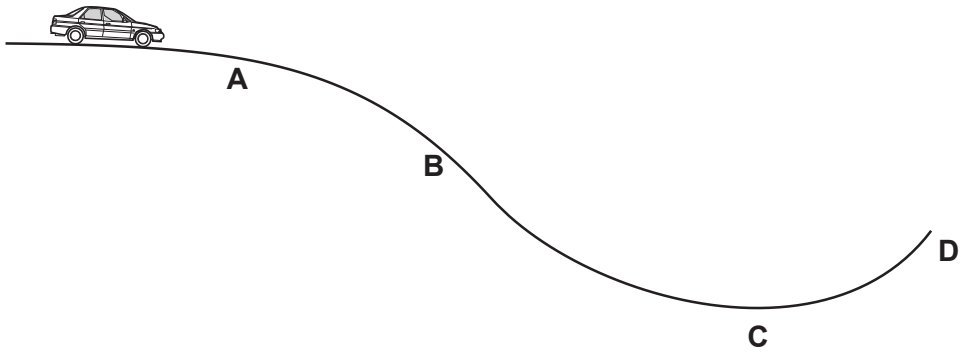
C nuclear fuel → reactor and boiler → generator → turbines

D nuclear fuel → reactor and boiler → turbines → generator

Question 15

A car is stationary at the top of a hill with the engine switched off. The brakes are released and the car rolls down the hill.

At which labelled point does the car have the greatest kinetic energy? Ignore friction.



Question 16

Which row gives the energy change in a battery and the energy change in a solar cell?

	battery	solar cell
A	chemical to electrical	electrical to light
B	chemical to electrical	light to electrical
C	electrical to chemical	electrical to light
D	electrical to chemical	light to electrical

Question 17

5

A helicopter takes off from the ground and rises vertically. It then hovers at a constant height above the ground.

Which sequence of energy changes takes place during the gain in height?

A chemical → gravitational potential → kinetic

B chemical → kinetic → gravitational potential

C gravitational potential → chemical → kinetic

D kinetic → chemical → gravitational potential