**CHINIOT ISLAMIA PUBLIC SCHOOL AND COLLEGE**

**1ST QUARTERLY TEST**

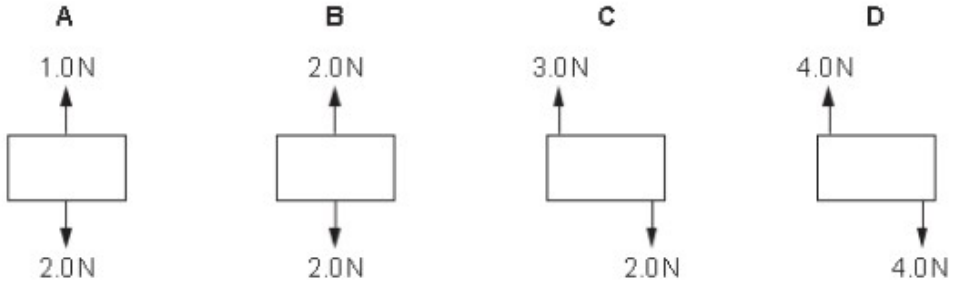
**First Quartely Test - OI Physics**

| **Name:** _____ | **Section:** _____ | **Roll No:** _____ |
|---|---|---|

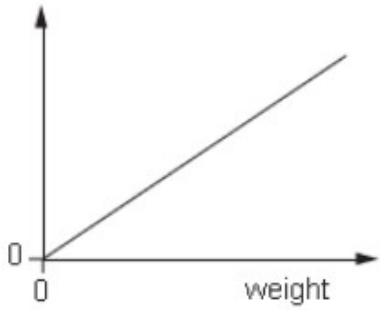
**Duration: 2 Hours** **Total Marks: 100**

Q1 .

1. 1 Four objects are each acted on by only two forces, as shown. Which object is in equilibrium?




2. A student adds weights to an elastic cord. He measures the length of the cord for each weight. He then plots a graph from the results, as shown.




What has he plotted on the vertical axis?

★ (a) measured length

★ (b) original length

★ (c) (measured length + original length)

★ (d) (measured length – original length)

3. During a Go Karting race, a car does 8 laps of a 300 m course. It takes 4.0 minutes to complete the race. What was the average speed of the Go Kart?

★ (a) 75 m/s

★ (b) 10 m/s

★ (c) 1.25 m/s

★ (d) 600 m/s

4. 1 A train begins a journey from a station and travels 60 km in a time of 20 minutes. What is the average speed of the train?

★ (a) 3.0 m / s

★ (b) 5.0 m / s

★ (c) 50 m / s

★ (d) 60 m / s

5. Which quantity gives the thermal capacity of a beaker?

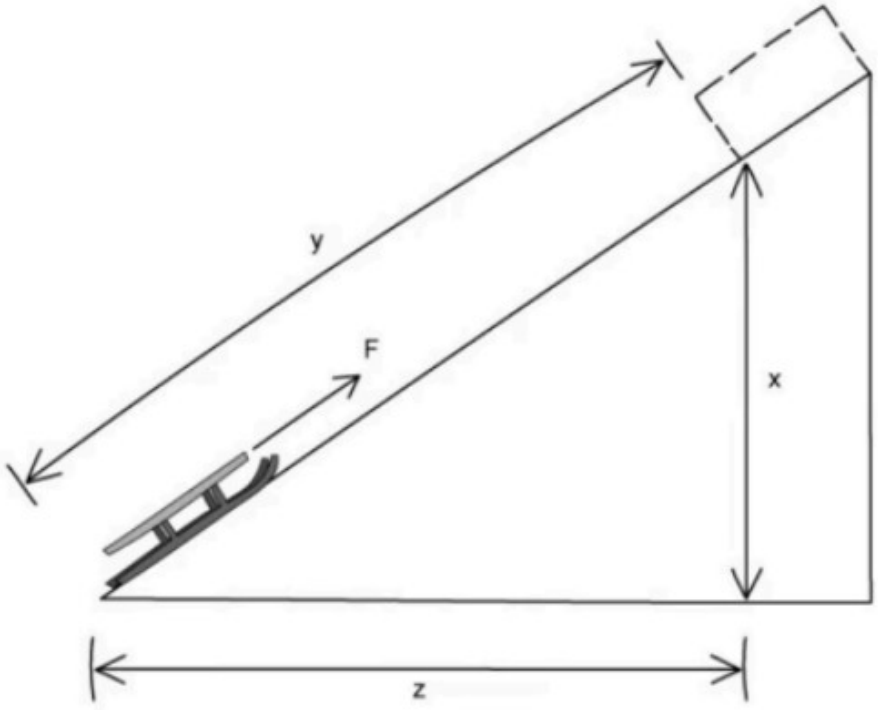
★ (a) the thermal energy required to change the state of the beaker at constant temperature.

★ (b) the thermal energy required to raise the temperature of the beaker by 1 °C.

★ (c) the total mass of hot liquid that the beaker can hold.

★ (d) the total volume of hot liquid tha the beaker can hold.

6. A sledge is pushed up a hill with a force, F.

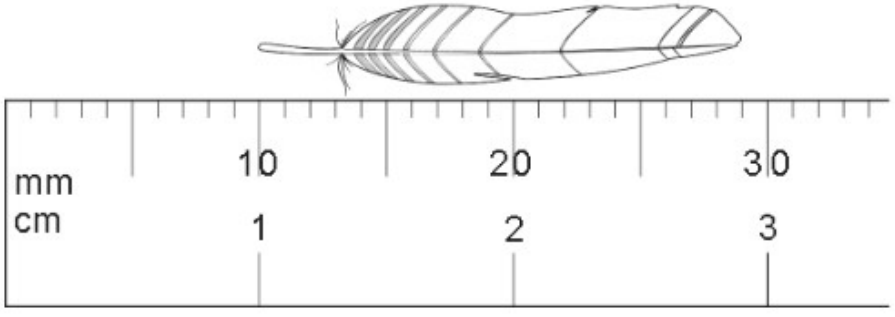



The work done on the sledge depends on the force applied and on a distance moved. Which distance?

★ (a) x ★ (b) y

★ (c) z ★ (d) x + z

7. The diagram shows an enlarged drawing of the end of a metre rule. It is being used to measure the length of a small feather.

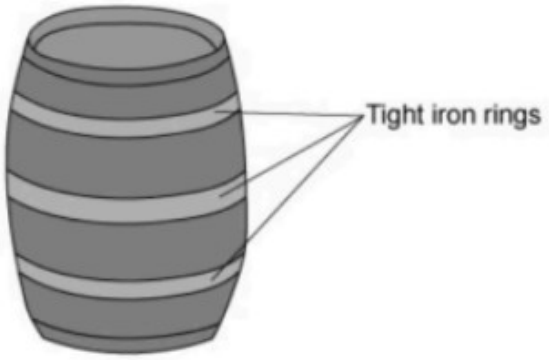



What is the length of the feather?

★ (a) 19 mm ★ (b) 29 mm

★ (c) 19 cm ★ (d) 29 cm

8. Wooden barrels are often reinforced by putting tight iron rings around them.




What procedure would make it easier to get the iron ring onto the barrel?

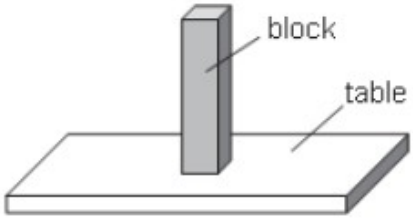
★ (a) Heating the barrel.

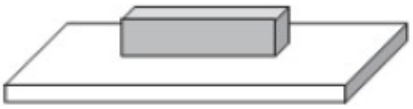
★ (b) Cooling the iron ring.

★ (c) Soaking the barrel in water.

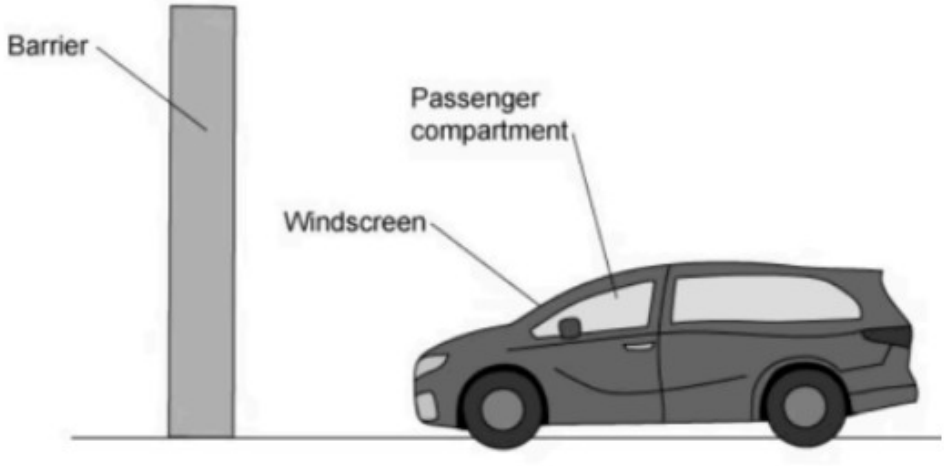
★ (d) Heating the iron ring.

9. A block with flat, rectangular sides rests on a table.




The block is now turned so that it rests with its largest side on the table.  How has this change affected the force and the pressure exerted by the block on the table?

10. A passenger of mass 90 kg is involved in a minor car crash.




The car approaches a solid barrier at 32 m/s. It crashes into the barrer and stops in 0.2s. Determine the impulse that must be applied to the car to bring it to rest.

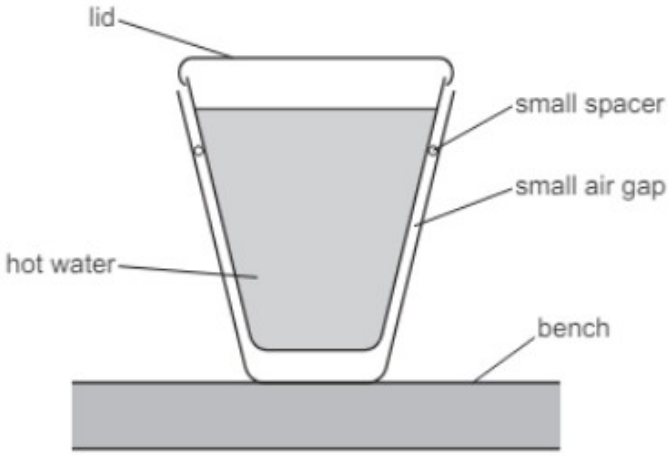
★ (a) 2.8 Ns

★ (b) 14 Ns

★ (c) 580 Ns

★ (d) 2900 Ns

11. Two plastic cups are placed one inside the other. A small spacer keeps the two cups separated. Hot water is poured into the inner cup and a lid is put on top, as shown.




Which statement is correct?

★ (a) The bench is heated by convection from the bottom of the outer cup.

★ (b) The lid reduces the energy lost by convection.

★ (c) There is no thermal conduction through the sides of either cup.

★ (d) Thermal radiation is prevented by the small air gap.

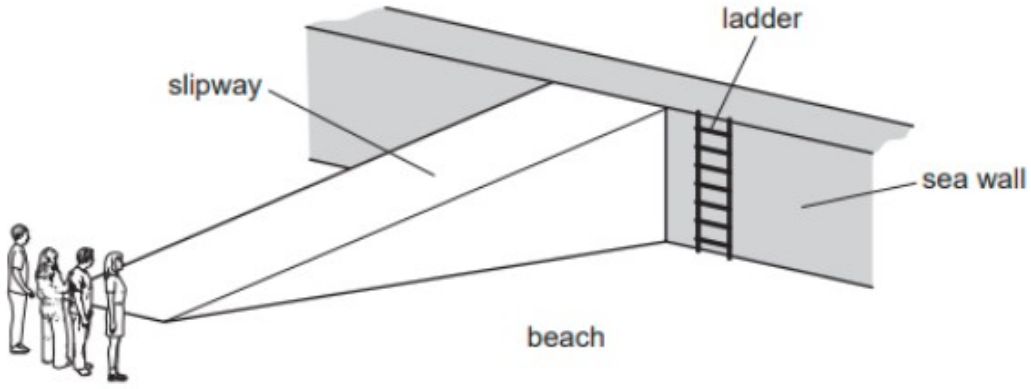
12. A 'yardarm' is a stick, hung from a string, that is used to weigh goods. Goods are placed in the pan on the left, and weights are added to the box on the right side until it balances. The weight of the pan and the box are such that the weight of the yardarm itself is entirely balanced by the pan. The yardarm is 65 cm long.


How many 0.5 N weights need to be added to the box in order to balance the yardarm?

★ (a) 2 ★ (b) 3

★ (c) 6 ★ (d) 12

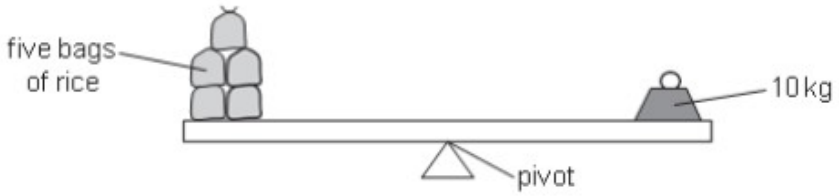
13. Four people of equal weight on a beach use different routes to get to the top of a sea wall.




Which person produces the greatest average power?

| person | | time taken / s |
|---|---|---|
| A | runs across the beach, then climbs the ladder | 8 |
| B | walks across the beach, then climbs the ladder | 16 |
| C | runs up the slipway | 5 |
| D | walks up the slipway | 10 |

14. Five identical bags of rice are balanced on a uniform beam by an object of mass 10 kg.




Two more identical bags of rice are added to the other five. The average position of the bags on the beam does not change. What mass now balances the bags?

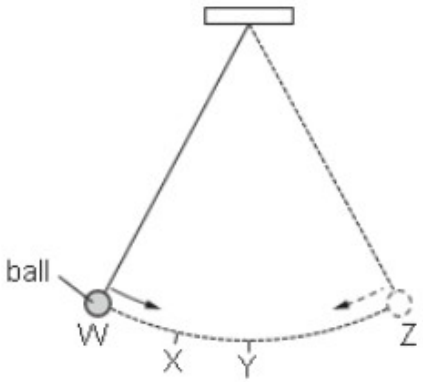
★ (a) 3.5 kg

★ (b) 7.0 kg

★ (c) 12 kg

★ (d) 14 kg

15. The diagram shows a ball hanging on a string. The ball swings from point W to point Z and back to point W.




Which statement about the ball is correct?

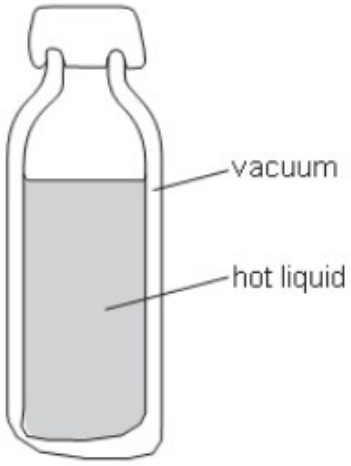
★ (a) The kinetic energy of the ball is greatest at point W.

★ (b) The kinetic energy of the ball is greatest at point X.

★ (c) The kinetic energy of the ball is greatest at point Y.

★ (d) The kinetic energy of the ball is the same at all points of the swing.

16. The diagram shows a vacuum flask used to keep liquid hot.




How does thermal energy pass through the vacuum?

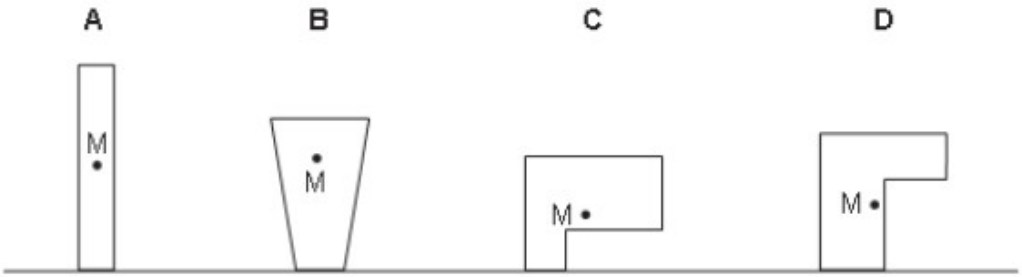
★ (a) Conduction only

★ (b) Convection only

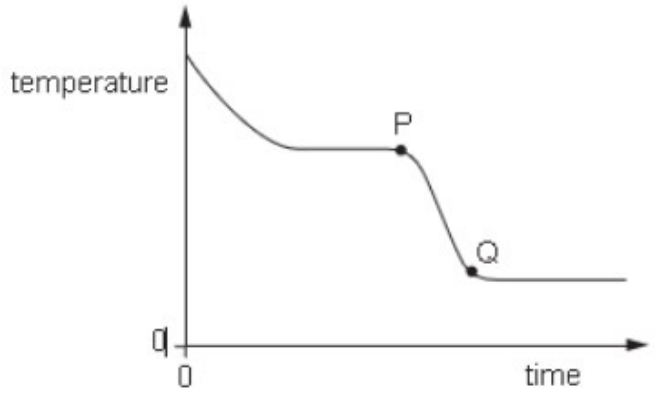
★ (c) Radiation

★ (d) Conduction and convection.

17. The diagrams show four objects A, B, C and D. The centre of mass M of each object is marked on the diagrams. Which object is not in equilibrium?



18. A substance loses thermal energy (heat) to the surroundings at a steady rate. The graph shows how the temperature of the substance changes with time.




What could the portion PQ of the graph represent?

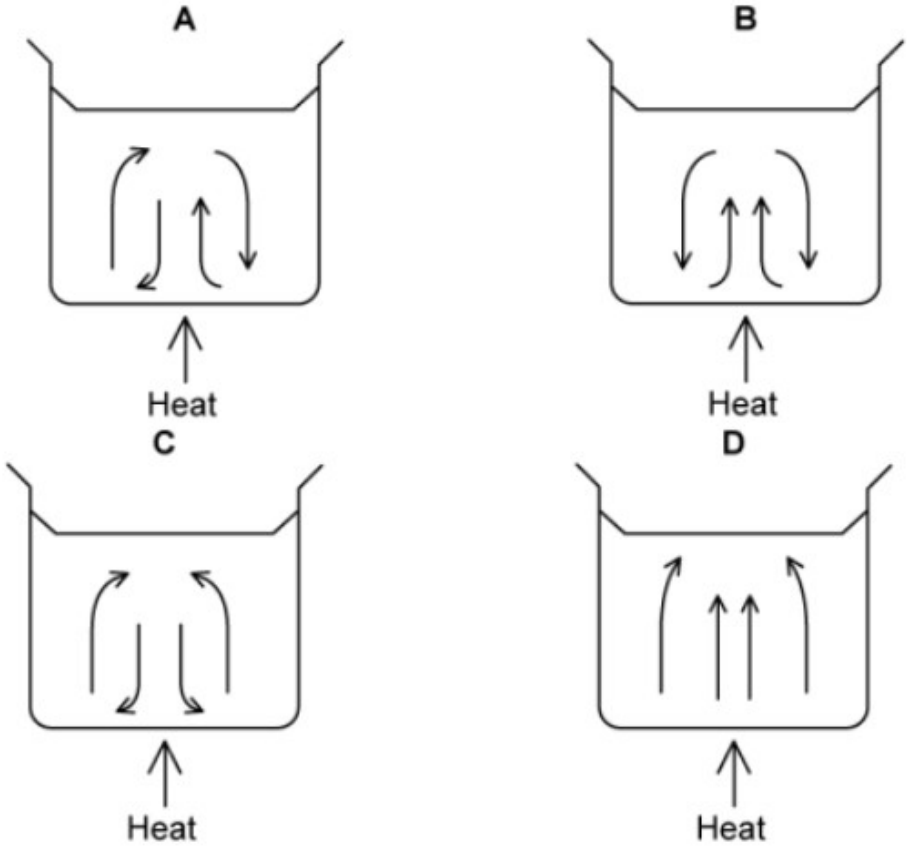
★ (a) gas condensing

★ (b) gas cooling

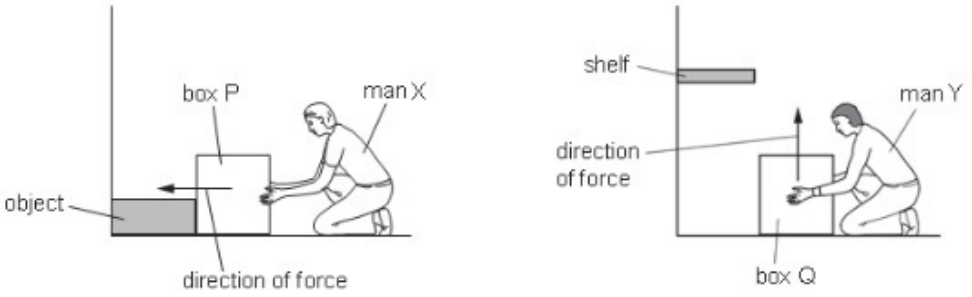
★ (c) liquid cooling

★ (d) liquid solidifying

19. Which diagram correctly shown the motion of particles in a beaker filled with liquid heated from the base?



20. **3** In a factory, two men X and Y try to move identical heavy boxes P and Q. Man X tries to push box P along the floor. The box does not move because an object is in the way. Man Y lifts box Q from the floor onto a shelf.




Which man does the most work on the box, and which box gains the most energy?

| | man doing most work | box gaining most energy |
|---|---|---|
| A | X | P |
| B | X | Q |
| C | Y | P |
| D | Y | Q |

21. Four different electric bicycles are driven along a road. The work done by their motor, and the time taken to do that work is shown in the table below. Which of the electric bicycles produces the most power?

| | **Work done / J** | **Time taken / s** |
|---|---|---|
| **A** | 10 000 | 20 |
| **B** | 20 000 | 40 |
| **C** | 400 000 | 400 |
| **D** | 2000 | 1 |

22. 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?

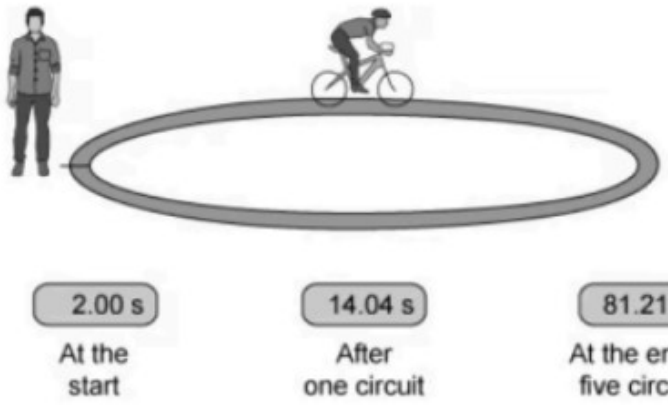
★ (a) balance, measuring cylinder and ruler.

★ (b) balance and thermometer.

★ (c) measuring cylinder and ruler.

★ (d) measuring cylinder, ruler and thermometer.

23. An Olympic cyclist rides round a velodrome track 5 times. The diagram below shows the reading on the stopwatch which was used to time the laps. Unfortunately, the person using the stopwatch started it a little early.




What is the average time to complete one lap of the velodrome?

★ (a) 16.24 s

★ (b) 14.04 s

★ (c) 15.84 s

★ (d) 15.21 s

24. The table gives four combinations of the force applied to a surface and the area over which it acts. Which row gives the smallest pressure exerted on the surface?

| | Force / N | Area / $m^2$ |
|---|---|---|
| **A** | 40 | 0.5 |
| **B** | 40 | 2.0 |
| **C** | 80 | 0.5 |
| **D** | 80 | 2.0 |

25. The Sun is the source of the majority of the energy on Earth. How does thermal energy from the Sun travel to the Earth?

★ (a) By conduction, convection and radiation.

★ (b) By conduction and convection only.

★ (c) By convection and radiation only.

★ (d) By radiation only.

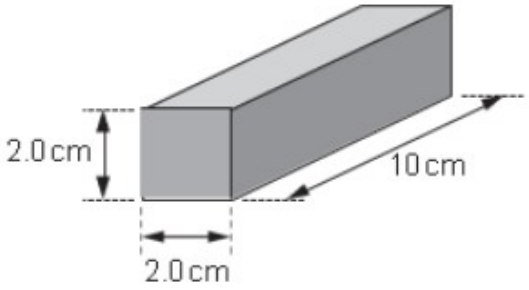
26. Which of the following terms and equations are equivalent to the change in an object's momentum?

| | Term | Equation |
|---|---|---|
| **A** | Force | $F = \frac{I}{t}$ |
| **B** | Impulse | $I = Ft$ |
| **C** | Force | $F = ma$ |
| **D** | Impulse | $I = \frac{\Delta p}{t}$ |

27. Which of these is the correct definition for momentum and its unit?

| | Definition | Unit |
|---|---|---|
| **A** | $p = m \div v$ | N/m |
| **B** | $v = p \times m$ | kgm/s |
| **C** | $v = p \div m$ | kgm/s |
| **D** | $p = m \times v$ | N/kg |

28. 1 The diagram shows a cuboid block made from a metal of density 2.5 g / $cm^3$.




What is the mass of the block?

★ (a) 8.0 g

★ (b) 16 g

★ (c) 50 g

★ (d) 100 g

29. Which of the following statements about convection is correct? Warm air rises because:

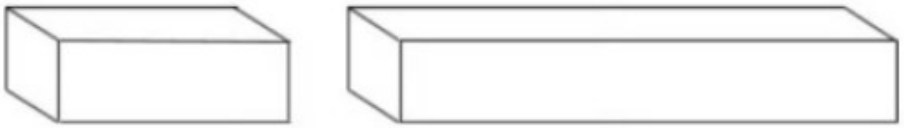
★ (a) The air molecules expand and become less dense.

★ (b) The air molecules move further apart, making the air less dense.

★ (c) The air molecules contract, making the air less dense.

★ (d) The air molecules move closer together, making the air less dense

30. Two beams have the same rectangular cross section, but one is longer than the other. Both beams are made from the same material.



Which quantity is the same in both beams?

★ (a) The volume

★ (b) The weight

★ (c) The mass

★ (d) The density

31. 1 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?

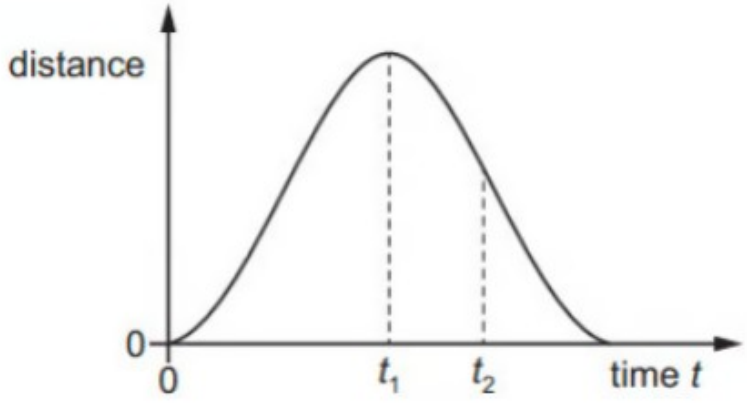
★ (a) mass only

★ (b) height and mass only

★ (c) length, width and height only

★ (d) length, width, height and mass

32. A train sets off from a station at time t = 0. The graph shows how the distance between the train and the station varies with time.




Which statement about the movement of the train between time $t_1$ and $t_2$ is correct?

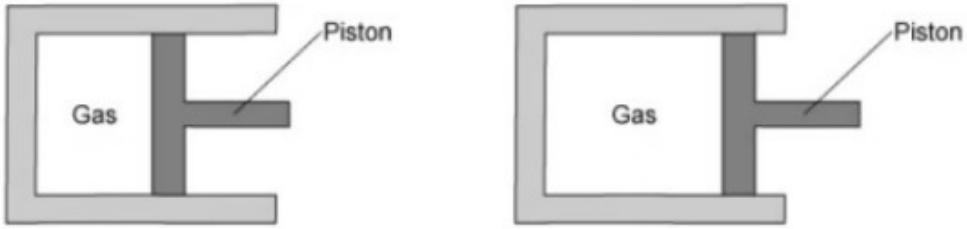
★ (a) Its speed is decreasing and it is moving away from the station.

★ (b) Its speed is decreasing and it is moving towards the station.

★ (c) Its speed is increasing and it is moving away from the station.

★ (d) Its speed is increasing and it is moving towards the station.

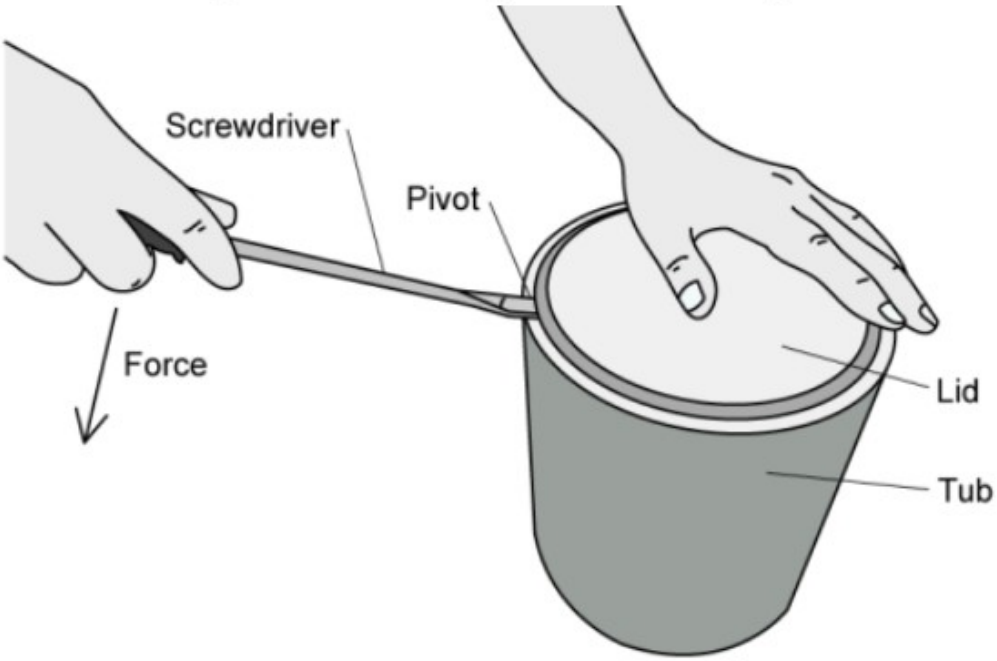
33. A sealed piston is used to expand a gas. No gas escapes during the process.




What happens to both the density of the gas and to its pressure when it is expanded in this way?

| | **Density** | **Pressure** |
|---|---|---|
| **A** | stays the same | stays the same |
| **B** | increases | decreases |
| **C** | decreases | stays the same |
| **D** | decreases | decreases |

34. A woman is using a screwdriver to prise the lid off a cylindrical tub of paint.




Which row states how she would increase the moment applied by the greatest amount?

| | Type of screwdriver | Force applied |
|---|---|---|
| A | Wider | Double |
| B | Wider | Half |
| C | Longer | Double |
| D | Longer | Half |

35. 1 A cotton sheet is ironed with a hot electric iron. How is energy transferred through the metal base of the iron to the sheet?

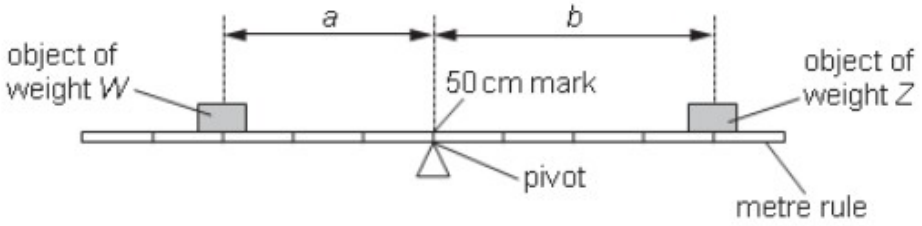
★ (a) by conduction only

★ (b) by convection only

★ (c) by radiation only

★ (d) by convection and radiation only

36. The diagram shows an object of weight $W$ and an object of weight $Z$ balanced on a uniform metre rule.




Which equation relating to $W$, $Z$, $a$ and $b$ is correct?

A $\frac{W}{a} \quad \frac{Z}{b}$

B $W \times Z = a \times b$

C $W \times a = Z \times b$

D $W \times (a + b) = Z$

37. Which quantity is measured in newton seconds (N s)?

★ (a) impulse

★ (b) moment

★ (c) power

★ (d) work done