**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

**PHYSICS** **0625/12**

Paper 1 Multiple Choice (Core) **October/November 2016**

**45 minutes**

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB recommended)

**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

**Read the instructions on the Answer Sheet very carefully.**

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / $s^2$).

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **17** printed pages and **3** blank pages.

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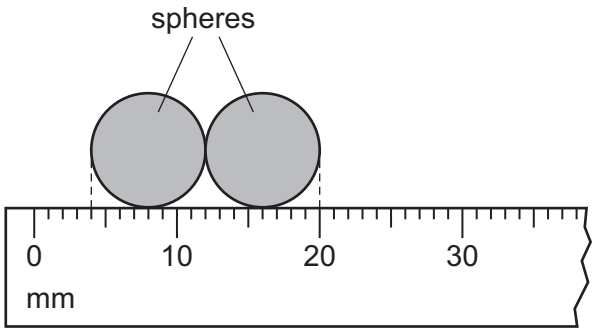
CAMBRIDGE International Examinations

**1** The diagram shows two identical spheres placed beside a ruler.

View solution

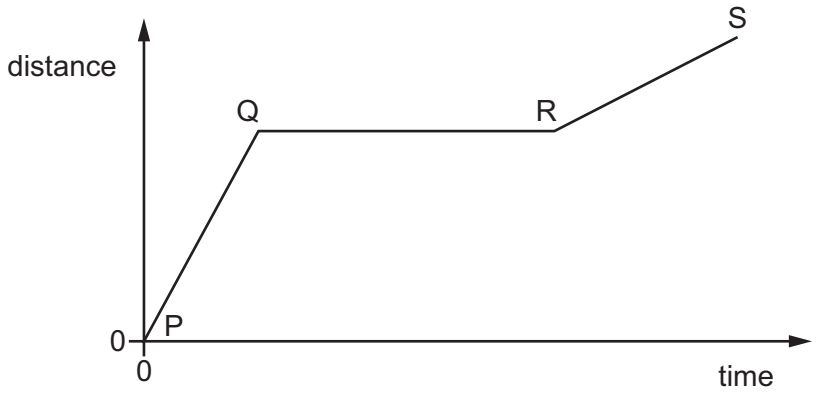



What is the radius of one sphere?

**A** 4.0 mm **B** 5.0 mm **C** 8.0 mm **D** 10 mm

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

View solution




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 | constant |

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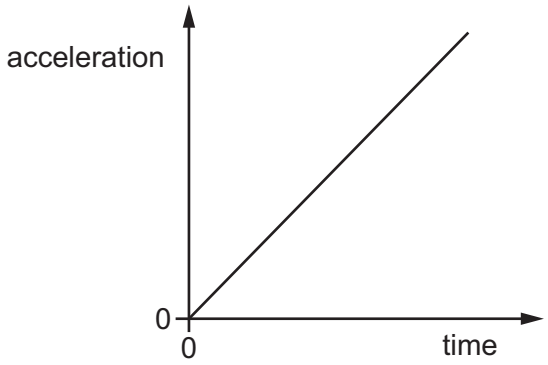
**3** A stone falls freely from the top of a cliff. Air resistance may be ignored.

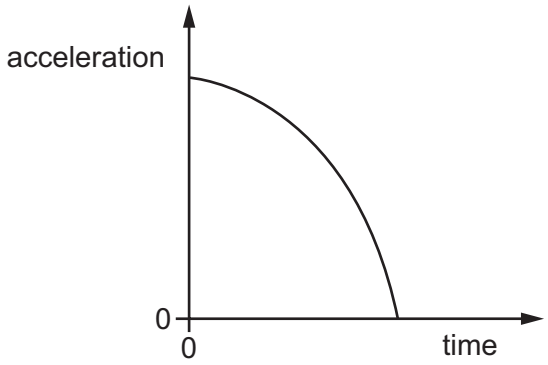
View solution

Which graph shows how the acceleration of the stone varies with time as it falls?

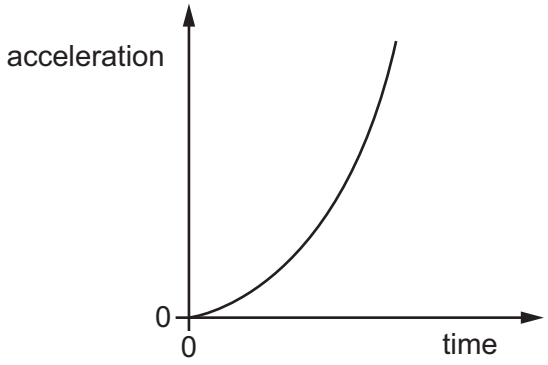
**A**



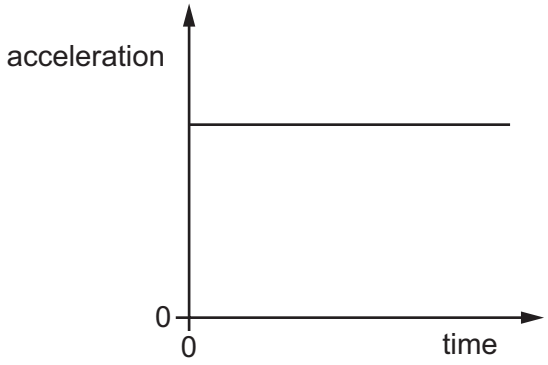

**B**




**C**




**D**




**4** A student writes about mass and weight.

View solution

Which statement is correct?

**A** A ship which is floating has mass but no weight.

**B** Mass is a scientific word that means the same as weight.

**C** Mass is measured in newtons.

**D** The mass of an astronaut is the same on the Moon as on the Earth.

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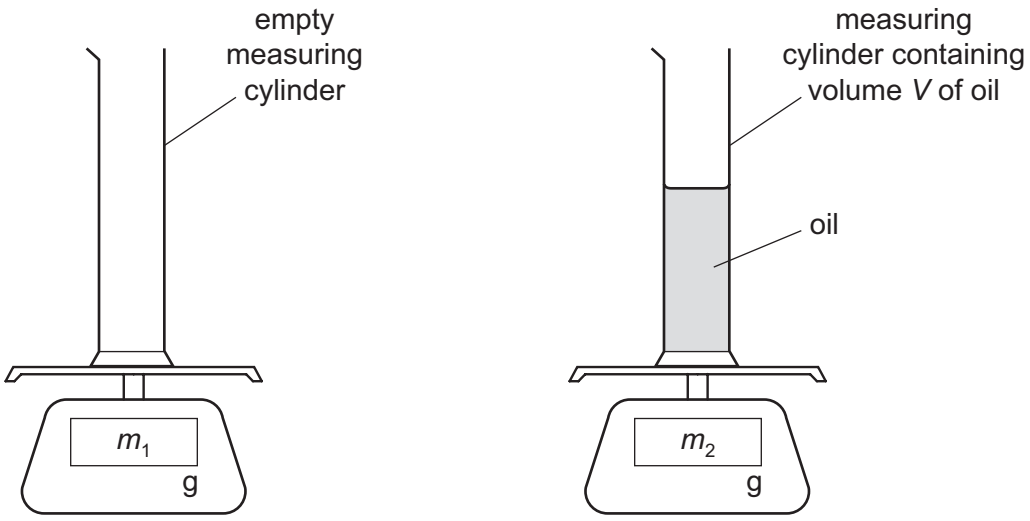
**5** A student uses a measuring cylinder and a balance to find the density of oil. The diagram shows the arrangement used.

View solution




Which calculation gives the density of the oil?

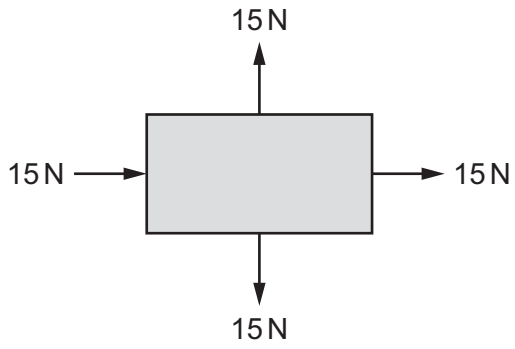
**A** $\frac{V}{m_2}$ **B** $\frac{V}{(m_2 - m_1)}$ **C** $\frac{m_2}{V}$ **D** $\frac{(m_2 - m_1)}{V}$

View solution

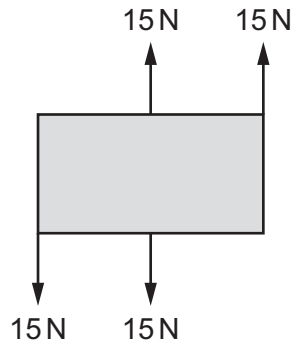
**6** Each diagram shows all the forces acting on an object.

In which diagram is the object in equilibrium?

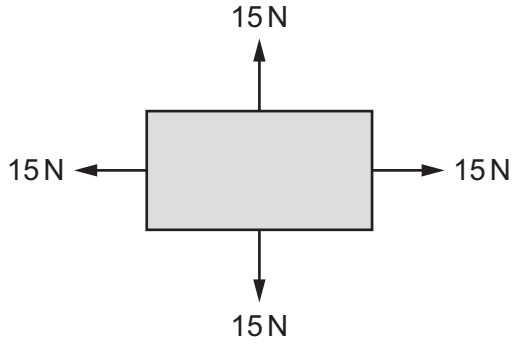
**A**



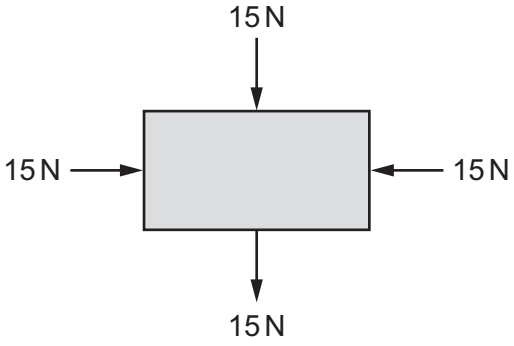

**B**




**C**




**D**

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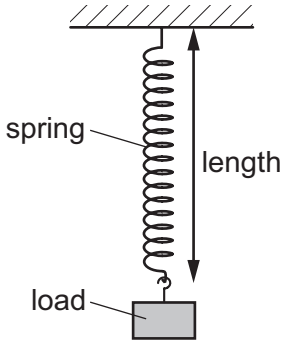
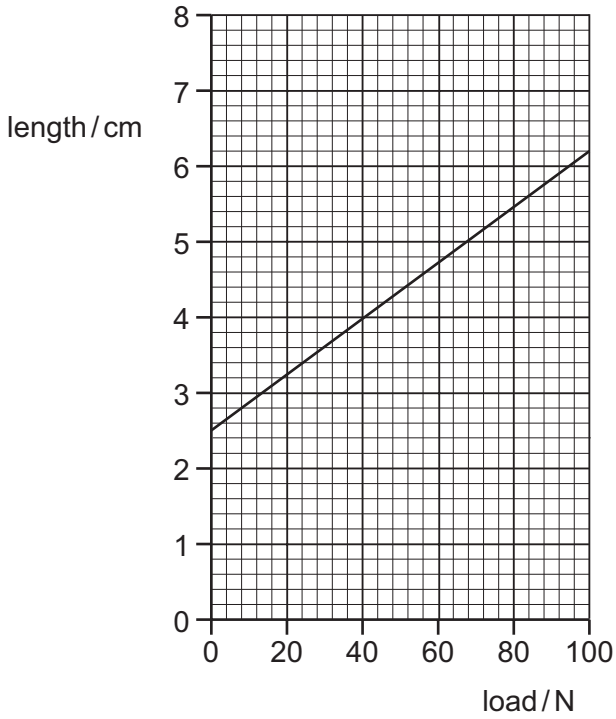
**7** The diagrams show a spring and a graph of the length of the spring against the load applied to it.

View solution



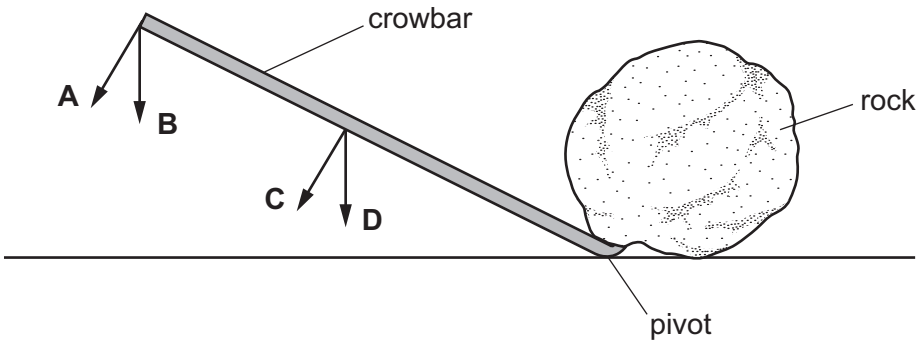

What is the extension of the spring when a load of 40 N is applied to it?

**A** 1.5 cm **B** 2.5 cm **C** 4.0 cm **D** 6.5 cm

**8** A force is applied to a long crowbar so as to move a large rock.

View solution

Which labelled arrow represents the smallest force needed to move the rock?




**9** What is the main energy change taking place in the battery of a mobile phone (cell phone) as it is being charged but not used?

View solution

**A** chemical energy increases

**B** elastic energy increases

**C** gravitational potential energy increases

**D** kinetic energy increases

**10** Electricity can be generated using different energy resources.

View solution

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

**A** geothermal

**B** hydroelectric

**C** solar

**D** water waves

**11** A child runs up a set of stairs four times. The time taken for each run is recorded.

View solution

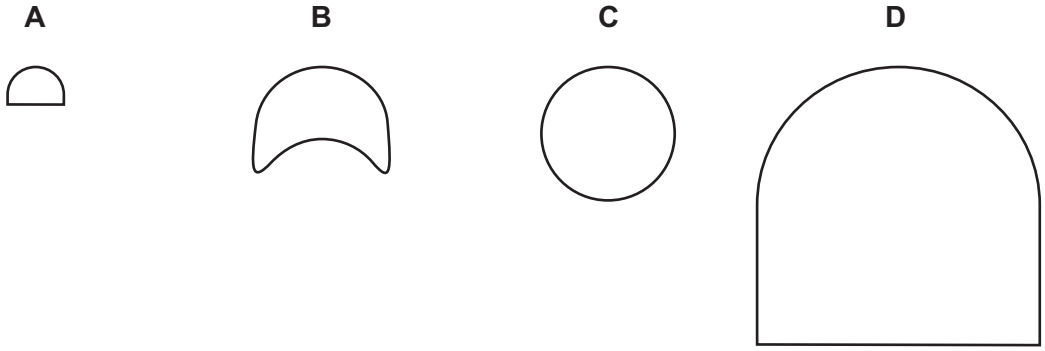
Which time is measured when the child's useful power is greatest?

**A** 10 s **B** 20 s **C** 30 s **D** 40 s

**12** The diagrams show the actual sizes of the heels of four different shoes, as seen from underneath the shoe.

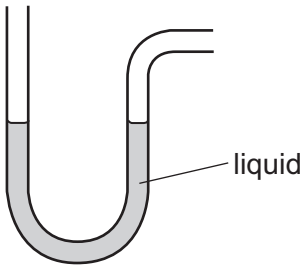
View solution

Which heel is **most** likely to cause damage to wooden floors?




**13** The diagram shows an instrument used to measure gas pressure.

View solution




What is the instrument called?

**A** ammeter

**B** barometer

**C** manometer

**D** thermometer

**14** Water can exist in three states: solid (ice), liquid and gas (steam).

View solution

In which state, or states, is the motion of the molecules **only** vibrational?

**A** ice only

**B** steam only

**C** liquid water only

**D** liquid water and ice only

**15** Which statement about evaporation is correct?

View solution

**A** Evaporation causes heating of the liquid.

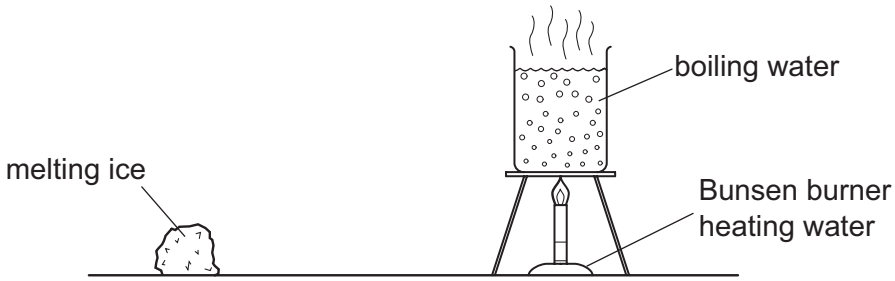
**B** Evaporation only happens from liquids.

**C** Molecules escape from anywhere in the liquid.

**D** Only the least energetic molecules escape.

**16** A piece of melting ice at 0 °C and a beaker of boiling water are both in a laboratory. The laboratory is at 20 °C.

View solution




What is happening to the temperature of the melting ice and what is happening to the temperature of the boiling water?

| | temperature of melting ice | temperature of boiling water |
|---|---|---|
| **A** | constant | constant |
| **B** | constant | increasing |
| **C** | increasing | constant |
| **D** | increasing | increasing |

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**17** A liquid-in-glass thermometer is to be calibrated in degrees Celsius.

Where should the bulb of the thermometer be placed to set a fixed point on the temperature scale?

View solution

**A** in a mixture of water and ice

**B** in a hot drink

**C** in a Bunsen burner flame

**D** in a refrigerator

**18** Aluminium foil is attached to the walls of a warm room in a cold country. This reduces the rate of thermal energy loss from inside the warm room.

View solution

Which method or methods of thermal energy transfer are reduced by the foil?

**A** conduction and convection only

**B** conduction only

**C** convection and radiation only

**D** radiation only

**19** On a very cold day, a boy puts one hand on the metal handlebars of his bicycle. He puts the other hand on the rubber hand grip.

The metal feels colder than the rubber hand grip, although they are both at the same temperature.

View solution

Why is this?

**A** The metal has a higher melting point than the rubber.

**B** The metal has a lower thermal capacity than the rubber.

**C** The metal is a better thermal conductor than the rubber.

**D** The metal radiates more infra-red radiation than the rubber.

**20** The box contains a list of four types of wave.

View solution

| | | | |
|---|---|---|---|
| $\gamma$-rays | sound | ultraviolet | X-rays |

How many waves in the list are transverse waves?

**A** 1 **B** 2 **C** 3 **D** 4

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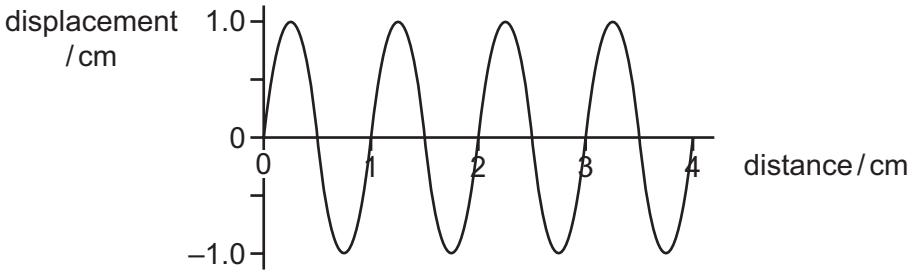
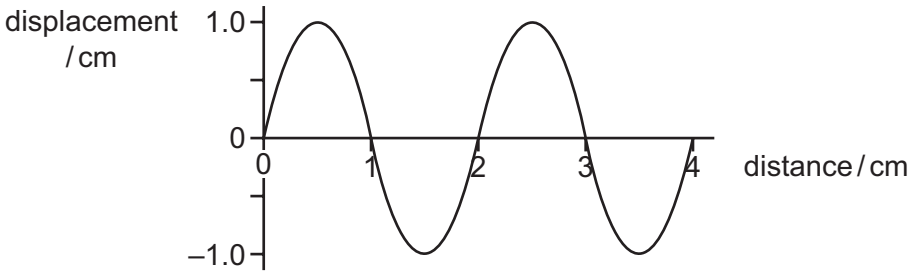
**21** Which wave has an amplitude equal to half its wavelength?

View solution

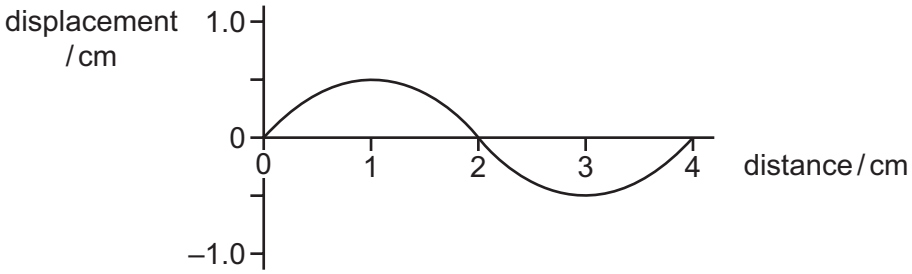
**A**



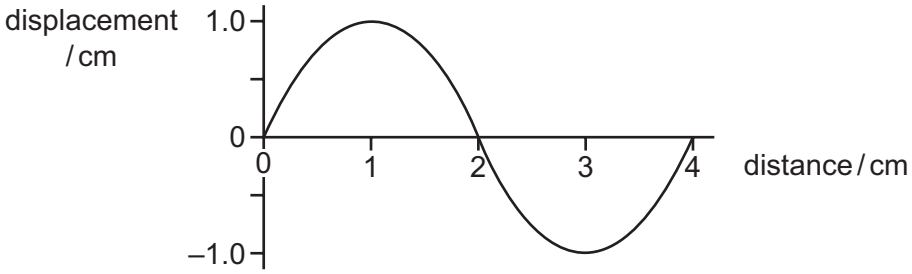

**B**




**C**




**D**

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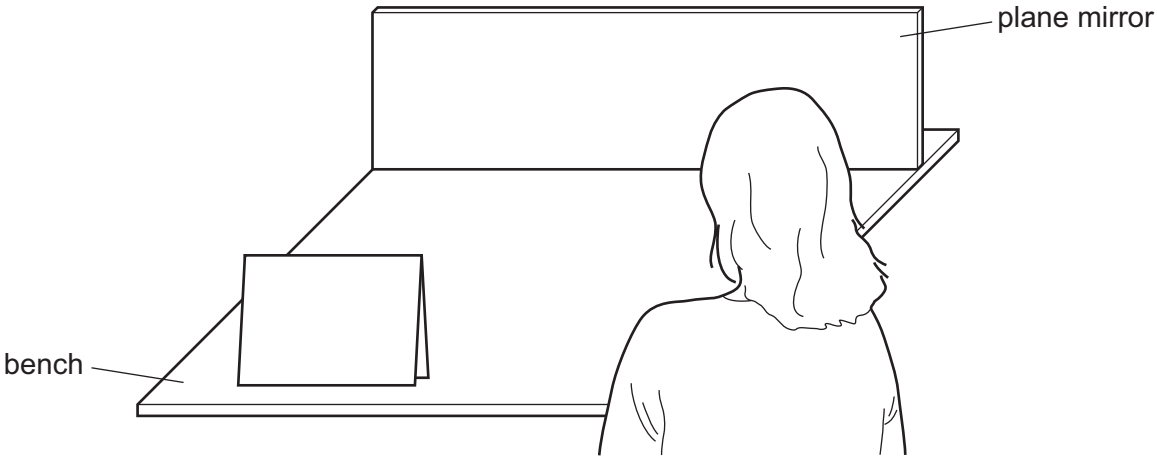
**22** A card with the letter **R** is made by a student. The letter is drawn on **one side**, as shown.

View solution




A plane mirror is mounted vertically on a bench. The student places the card on the bench so that the letter is upright and **facing the mirror**.




How does the image formed by the mirror appear to the student?

**A** **B** **C** **D**



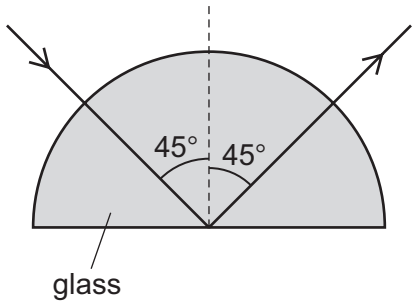
**23** A student draws four diagrams to represent light passing from air through a glass block and then back into the air.

View solution

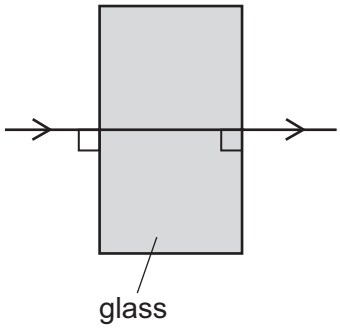
The critical angle for the glass is 42°.

In which diagram is the path of the light through the glass block **not** correct?

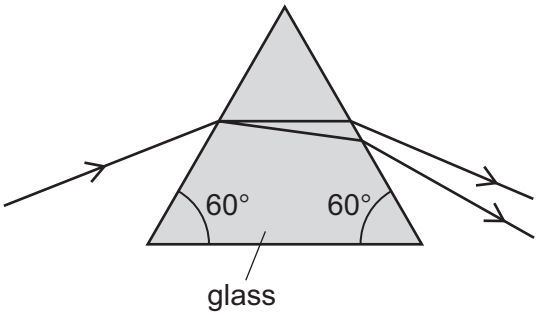
**A**



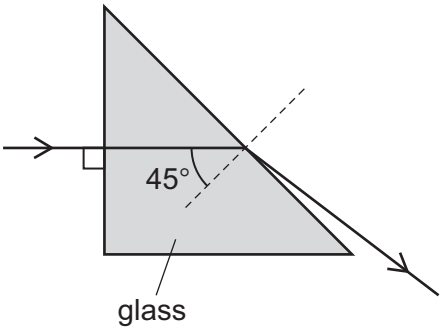

**B**




**C**




**D**




**24** Which part of the electromagnetic spectrum is used to send television signals from a satellite to Earth?

View solution

**A** infra-red

**B** microwaves

**C** ultraviolet

**D** visible light

**25** A girl notices that, when she shouts into a cave, she hears an echo.

View solution

Which wave property causes the echo?

**A** diffraction

**B** dispersion

**C** reflection

**D** refraction

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**26** Which property of a sound wave affects the loudness of the sound?

View solution

**A** amplitude

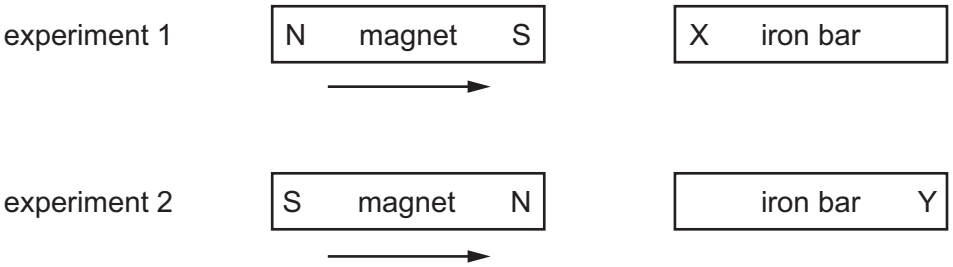
**B** frequency

**C** speed

**D** wavelength

**27** In two separate experiments, a magnet is brought near to an unmagnetised iron bar. This causes the bar to become magnetised.

View solution

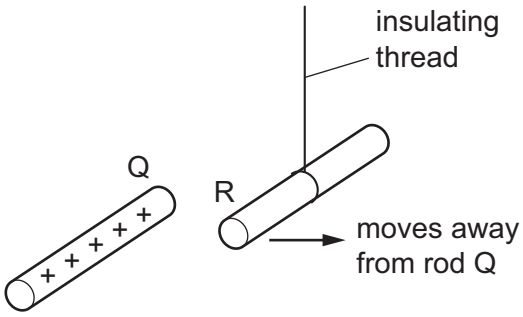



Which magnetic pole is induced at X and at Y?

| | pole induced at X | pole induced at Y |
|---|---|---|
| **A** | N | N |
| **B** | N | S |
| **C** | S | N |
| **D** | S | S |

**28** In the diagram, rod R hangs from an insulating thread.

View solution




When the positively charged rod Q is brought close to rod R, rod R moves away from rod Q.

Which conclusion can be made from this observation?

**A** Rod R is charged, but it is not possible to identify the sign of the charge.

**B** Rod R must be positively charged.

**C** Rod R must be negatively charged.

**D** Rod R is uncharged.

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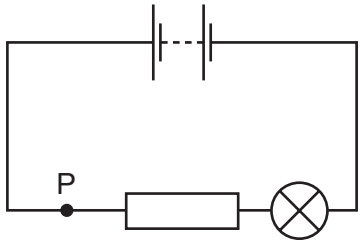
**29** The diagram shows a lamp in a circuit.

View solution




Which change to the circuit would increase the current in the lamp?

**A** adding another resistor in parallel with the one in the circuit

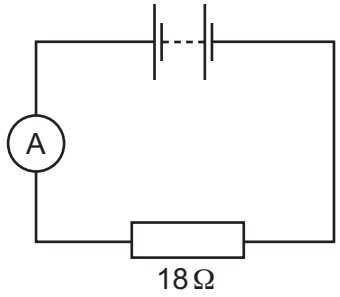
**B** adding another resistor in series with the one in the circuit

**C** decreasing the electromotive force (e.m.f.) of the battery in the circuit

**D** moving the lamp to point P in the circuit

**30** An ammeter and an 18 Ω resistor are connected in series with a battery. The reading on the ammeter is 0.50 A.

View solution




What is the electromotive force (e.m.f.) of the battery?

**A** 9.0 N **B** 9.0 V **C** 36 N **D** 36 V

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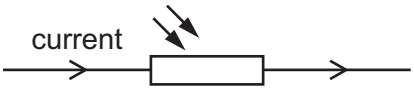
**31** A source of constant electromotive force (e.m.f.) is connected across a light-dependent resistor (LDR).

View solution

There is an electric current in the LDR.



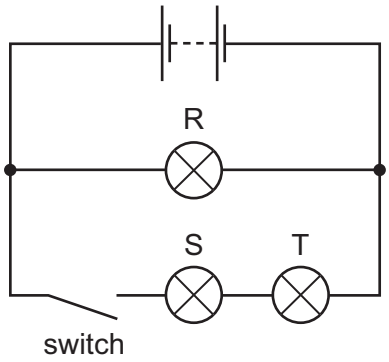

The brightness of the light falling on the LDR is reduced.

Which row shows what happens to the resistance of the LDR and what happens to the current?

| | resistance | current |
|---|---|---|
| **A** | decreases | decreases |
| **B** | decreases | increases |
| **C** | increases | decreases |
| **D** | increases | increases |

**32** The diagram shows an electric circuit.

View solution




When the switch is open, which lamp or lamps are **not** lit?

**A** R only

**B** S only

**C** R, S and T

**D** S and T only

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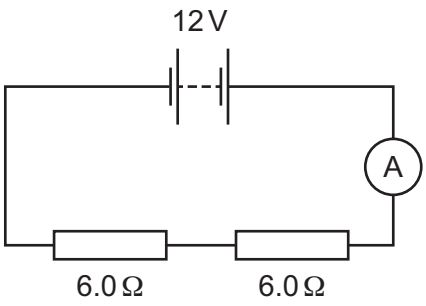
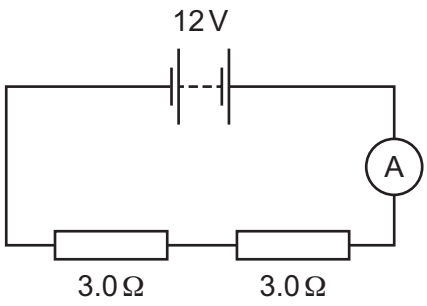
**33** In which circuit does the ammeter read 2.0 A?

View solution

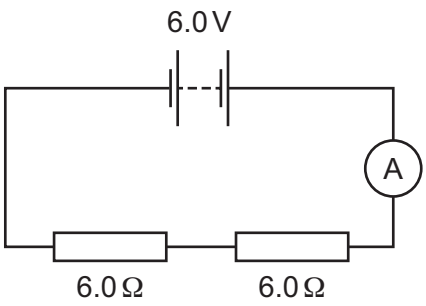
**A**



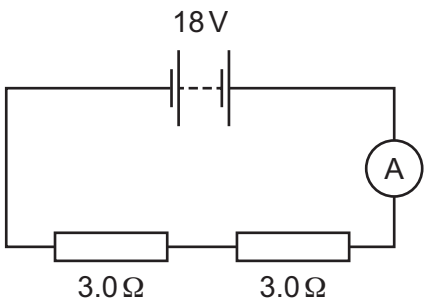

**B**




**C**




**D**




**34** An electric kettle has a metal casing. The cable for the kettle contains a wire that is connected to the earth pin of the plug.

View solution

Which danger does this guard against?

**A** the cable to the kettle becoming too hot

**B** the casing of the kettle becoming live

**C** the casing of the kettle becoming wet on the outside

**D** the casing of the kettle overheating

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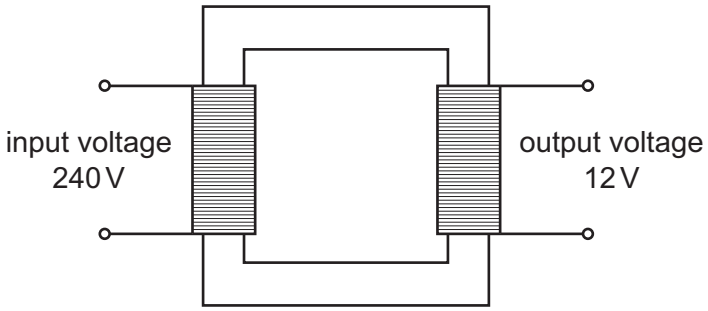
**35** A transformer has an input voltage of 240 V and an output voltage of 12 V.

View solution




What is a possible pair of values for the number of turns in the primary coil and the number of turns in the secondary coil?

| | number of turns in primary coil | number of turns in secondary coil |
|---|---|---|
| **A** | 12 | 4800 |
| **B** | 240 | 4800 |
| **C** | 4800 | 12 |
| **D** | 4800 | 240 |

**36** An electric current can produce a heating effect and a magnetic effect.

View solution

Which row shows the effect that a relay uses and one application of a relay?

| | effect used by a relay | one application of a relay |
|---|---|---|
| **A** | heating effect | allowing a small current to switch on a large current |
| **B** | heating effect | changing the voltage of an a.c. supply |
| **C** | magnetic effect | allowing a small current to switch on a large current |
| **D** | magnetic effect | changing the voltage of an a.c. supply |

**37** A nuclide of sodium can be represented by $^{23}_{11}Na$.

View solution

Which row gives the numbers of particles in a neutral sodium atom?

| | number of electrons | number of protons | number of neutrons |
|---|---|---|---|
| **A** | 11 | 11 | 12 |
| **B** | 12 | 11 | 23 |
| **C** | 12 | 12 | 11 |
| **D** | 23 | 23 | 11 |

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**38** Which is the most effective precaution to reduce the risk when handling, storing or using a radioactive source that emits γ-rays?

View solution

**A** Handle the source for the least possible time.

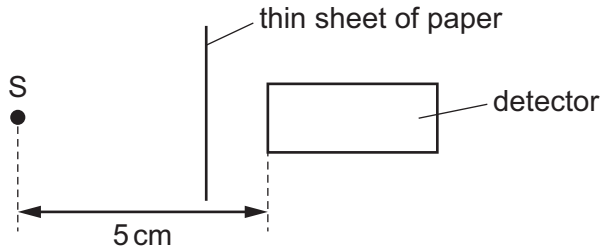
**B** Have a fire extinguisher nearby when using the source.

**C** Store the source at a low temperature.

**D** Wear plastic safety goggles when handling the source.

**39** Radioactive source S emits α-particles, β-particles and γ-rays. A detector is placed 5 cm away from S. A thin sheet of paper is placed as shown in the diagram.

View solution




Which emissions from the source can be detected?

**A** α-particles and β-particles only

**B** α-particles and γ-rays only

**C** β-particles and γ-rays only

**D** α-particles, β-particles and γ-rays

**40** A radioactive source has a half-life of 3.0 days. It emits radiation at a rate of 1200 particles per minute.

View solution

At what rate was it emitting radiation 6.0 days **earlier**?

**A** 300 particles per minute

**B** 2400 particles per minute

**C** 4800 particles per minute

**D** 7200 particles per minute

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