



### Supplementary Multiple-Choice Answer Sheet

Candidate number	<input type="text"/>	Candidate name	<input type="text"/>
Centre number	<input type="text"/>	Name of exam	<input type="text"/>
Exam series	<input type="text"/>	Supervisor	<input type="text"/>
Syllabus code	<input type="text"/>	Syllabus title	<input type="text"/>
Component code	<input type="text"/>		

If the candidate is **absent** or has **withdrawn** shade here

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

21	A	B	C	D
22	A	B	C	D
23	A	B	C	D
24	A	B	C	D
25	A	B	C	D
26	A	B	C	D
27	A	B	C	D
28	A	B	C	D
29	A	B	C	D
30	A	B	C	D
31	A	B	C	D
32	A	B	C	D
33	A	B	C	D
34	A	B	C	D
35	A	B	C	D
36	A	B	C	D
37	A	B	C	D
38	A	B	C	D
39	A	B	C	D
40	A	B	C	D

#### Instructions

Shade ONE letter only for each question.  
Make sure you put your answer in line with the correct question number.

#### Example

For question 1,  
if you think B is the right answer,  
fill in your answer sheet like this:

1	A	B	C	D



Cambridge Assessment International Education  
Cambridge Ordinary Level

**PHYSICS**

**5054/01**

Paper 1 Multiple Choice

**Practice Paper**

**1 hour**

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

\* 9 4 8 5 2 3 3 2 3 3 8 \*

**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.**

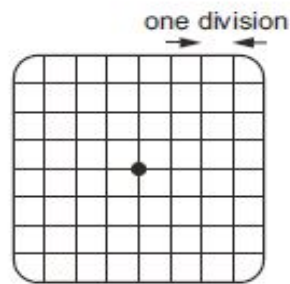
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.  
Any rough working should be done in this booklet.  
Electronic calculators may be used.



Cambridge Assessment  
International Education

[Turn over

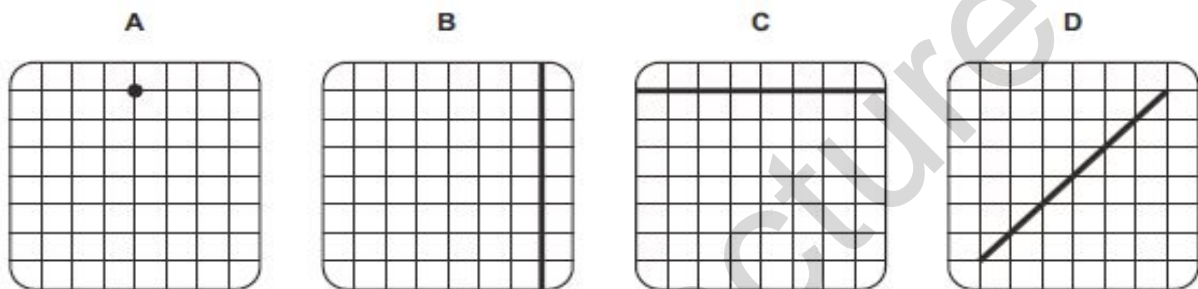
- 1 An oscilloscope is used to measure potential difference (p.d.). The trace with no input connected is shown.



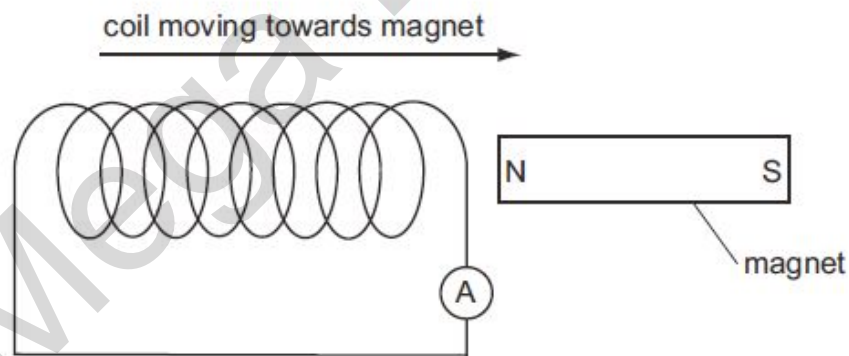
A 1.5V d.c. supply is connected to the oscilloscope.

The Y-gain is set at 0.5V/div. The time-base is set at 0.5ms/div.

Which trace shows a supply of 1.5V d.c.?



- 2 The diagram shows how a magnet and a coil may be used to induce an electric current.

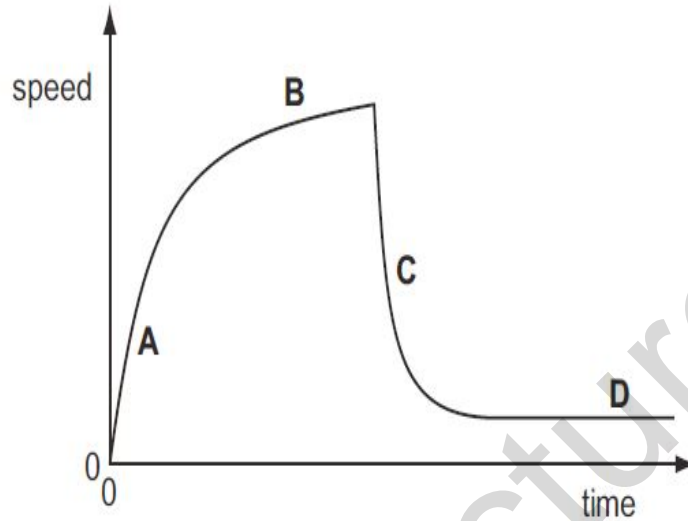


How could the ammeter reading be increased?

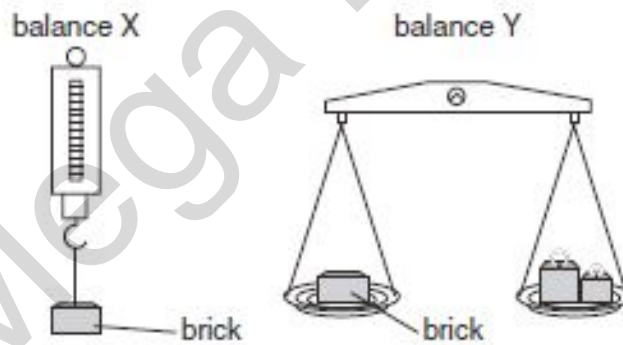
- A Move the coil more slowly.
- B Put a resistor in series with the ammeter.
- C Turn the magnet round, then move the coil.
- D Use a coil with more turns.

- 3 The speed-time graph for a falling skydiver is shown below. The skydiver alters his fall first by spreading his arms and legs and then by using a parachute.

Which part of the graph shows the diver falling with terminal velocity?



- 4 A brick is placed on a newton balance X and then on a beam balance Y.



What is measured by each balance?

	<i>balance X</i>	<i>balance Y</i>
A	mass	mass
B	mass	weight
C	weight	mass
D	weight	weight

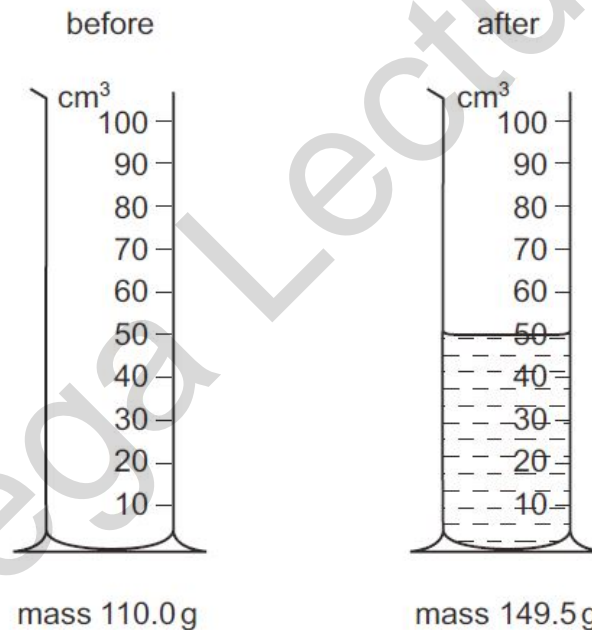
[Turn over

5 A body is moving in a circle at a constant speed.

Which of the following statements about the body is true?

- A There is no acceleration.
- B There is a force acting at a tangent to the circle.
- C There is a force acting away from the centre of the circle.
- D There is a force acting towards the centre of the circle.

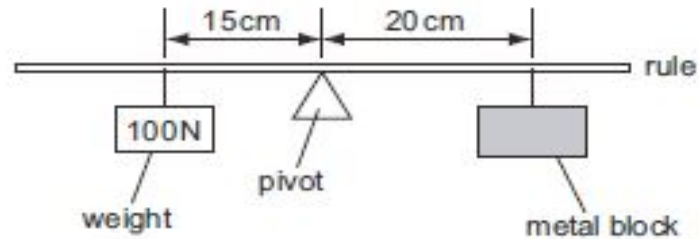
6 The mass of a measuring cylinder is measured before and after pouring a liquid into it.



What is the density of the liquid?

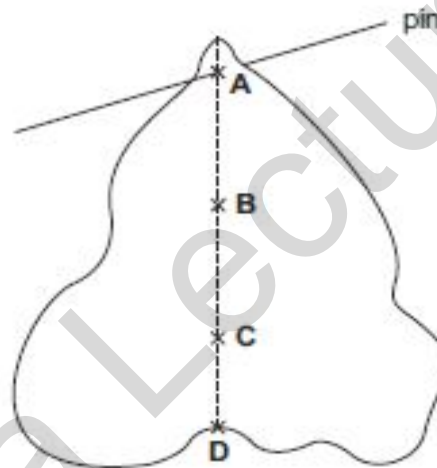
- A  $0.19 \text{ g/cm}^3$
- B  $1.3 \text{ g/cm}^3$
- C  $1.4 \text{ g/cm}^3$
- D  $2.2 \text{ g/cm}^3$

- 7 The diagram shows a uniform half-metre rule balanced at its mid-point.

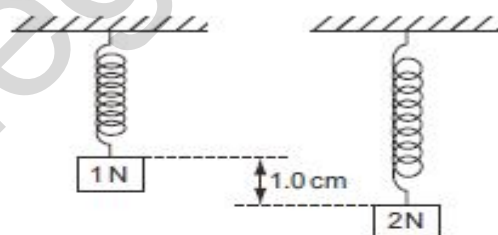


What is the weight of the metal block?

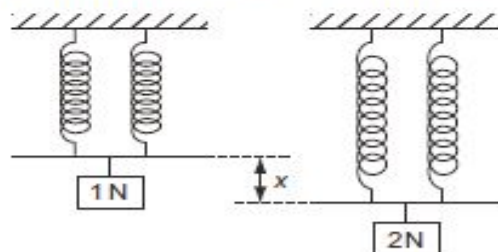
- A 50 N      B 75 N      C 100 N      D 150 N
- 8 A piece of uniform card is suspended freely from a horizontal pin.  
At which of the points shown is its centre of gravity?



- 9 A single spring is loaded with a 1 N weight. The load is then increased to 2 N and the extension increases by 1.0 cm, as shown.



Two springs that are identical to the first one are put side by side. They are connected at both ends, and a 1 N weight is hung on them. The load is then increased to 2 N.



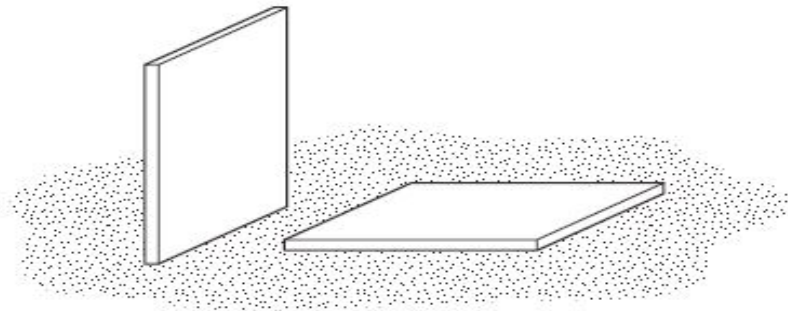
What is the new increase  $x$  in the extension?

- A 0.5 cm      B 1.0 cm      C 2.0 cm      D 3.0 cm

[Turn over



- 10 A builder leaves two identical, heavy, stone tiles resting on soft earth. One is vertical and the other is horizontal.

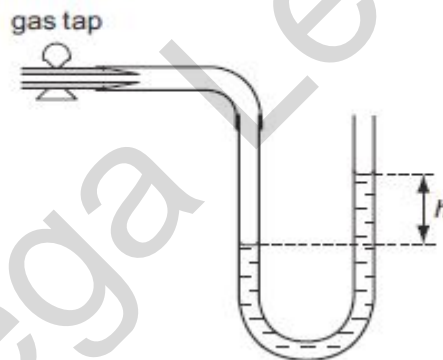


After a few hours, the vertical tile has started to sink into the soft earth, but the horizontal one has not.

Which row correctly compares the forces and the pressures that the tiles exert on the earth?

	forces	pressures
<b>A</b>	different	different
<b>B</b>	different	same
<b>C</b>	same	different
<b>D</b>	same	same

- 11 A water manometer is connected to a gas supply. One end of the manometer is open to the atmosphere.



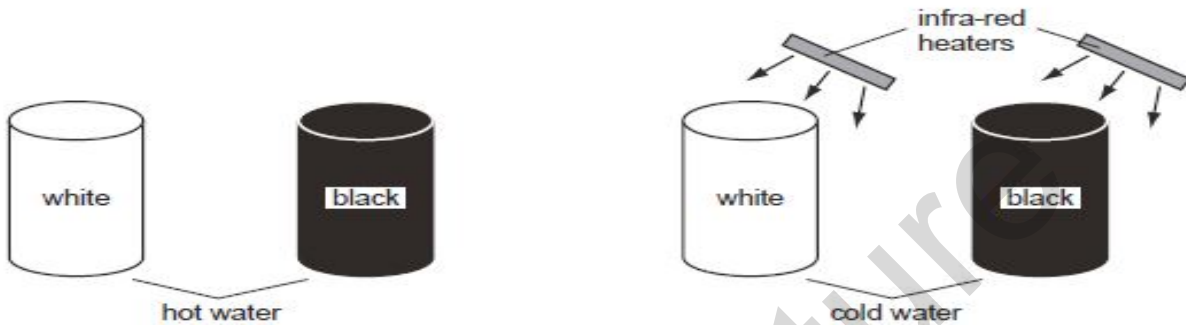
Which statement about the pressure of the gas supply is true?

- A The pressure is  $h$  cm of water.
  - B The pressure is  $h$  cm of water below atmospheric pressure.
  - C The pressure is the same as atmospheric pressure.
  - D The pressure is  $h$  cm of water above atmospheric pressure.
- 12 Which process in the Sun produces energy?
- A burning
  - B nuclear fission
  - C nuclear fusion
  - D radiation

- 13 A man weighs 600 N. He runs up a staircase of total height 4.0 metres in 3.0 seconds.  
How much useful power is needed to do this?

A 450 W      B 800 W      C 2400 W      D 7200 W

- 14 The diagrams show four cans in a cool room. They are painted as shown. One pair is filled with hot water and left to cool down. The other pair is filled with cold water and placed near infra-red heaters.



The hot water in the black can cools more quickly than the hot water in the white can. The cold water in the black can heats up more quickly than the cold water in the white can.

Which row shows the reasons for this?

	better emitter of infra-red	better absorber of infra-red
A	black	black
B	black	white
C	white	black
D	white	white

- 15 An ice-cube has a mass of 7.50 g. The ice-cube is at 0°C.

Heat from the surroundings reaches the ice-cube at an average rate of 1.25 J/s.

How long does it take for all of the ice to melt?  
(specific latent heat of fusion of ice = 333 J/g)

A 35.5 s      B 55.5 s      C 2000 s      D 3120 s

- 16 The distance between the ice point and the steam point in a liquid-in-glass thermometer is 20 cm.

The top of the liquid thread is 12 cm above the ice point.

What is the temperature?

A 40°C      B 60°C      C 80°C      D 88°C

[Turn over



17 A guitar string is made to vibrate.

What makes the pitch of the note rise?

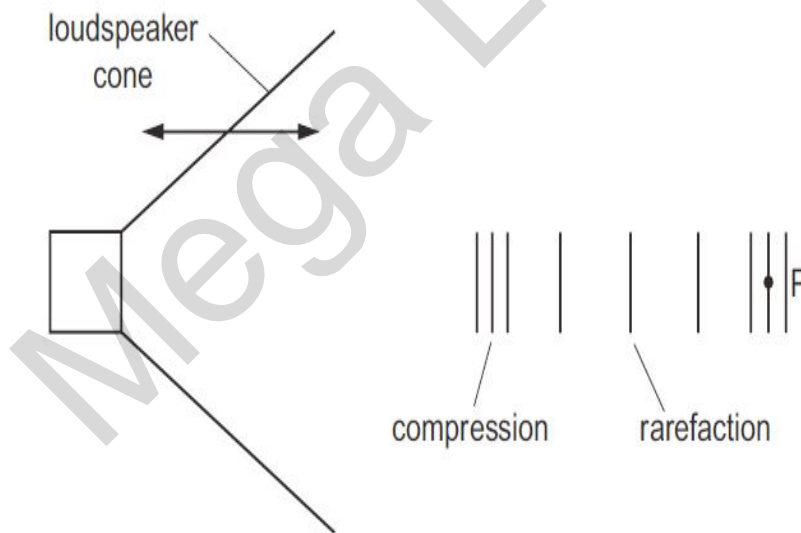
- A a decrease in the amplitude of vibration
- B a decrease in the frequency of vibration
- C an increase in the amplitude of vibration
- D an increase in the frequency of vibration

18 A magnet is moved towards a coil of insulated wire. A voltmeter connected across the coil shows a positive reading.

What produces a higher reading on the voltmeter?

- A moving the magnet away from the coil at the same speed
- B moving the magnet away from the coil at a slower speed
- C moving the magnet towards the coil at a faster speed
- D moving the magnet towards the coil at a slower speed

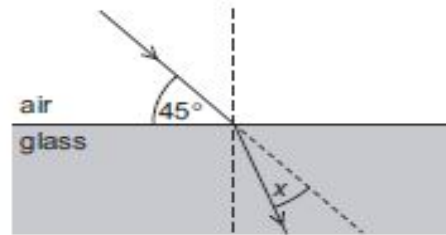
19 Compressions and rarefactions are sent out from a loudspeaker cone as it vibrates backwards and forwards. The frequency of vibration is 50Hz.



A compression is at point P. How much time elapses before the next rarefaction arrives at P?

- A 0.010s
- B 0.020s
- C 25s
- D 50s

20 A ray of light is incident on the surface of a glass block, as shown in the diagram below.



The refractive index of the glass is 1.5.

The light ray changes direction when entering the glass.

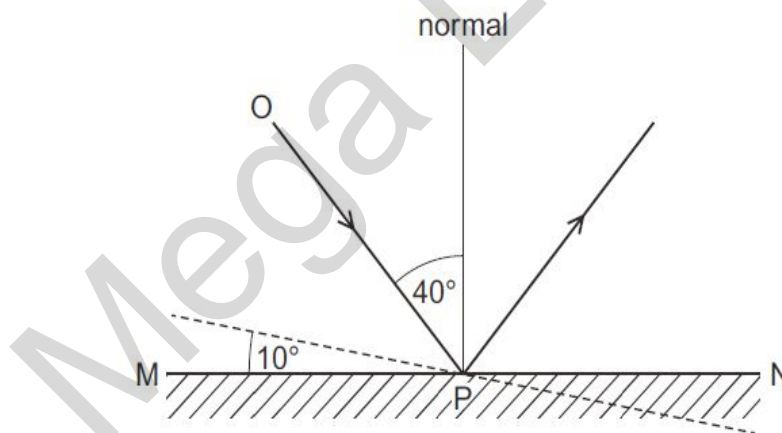
What is the angle  $x$  through which the ray moves?

- A**  $30^\circ$       **B**  $28^\circ$       **C**  $17^\circ$       **D**  $15^\circ$

21 Which statement about red light and blue light is correct?

- A** Red light has a higher frequency than blue light.  
**B** Red light has a longer wavelength than blue light.  
**C** Red light has the same speed in glass as blue light.  
**D** Red light is refracted by a glass prism more than blue light.

22 The angle of incidence of ray OP on the plane mirror MN is  $40^\circ$ .



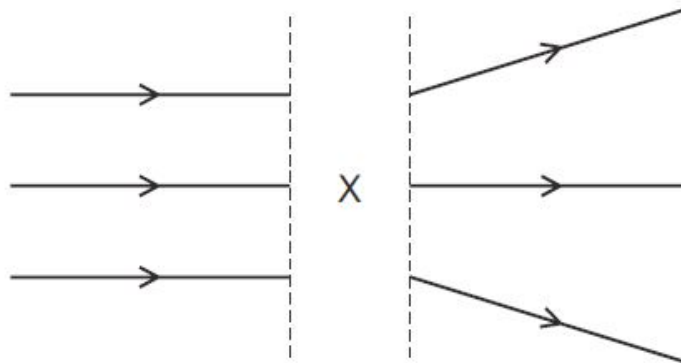
The mirror is rotated through  $10^\circ$ , as shown by the dashed line. The direction of the incident ray OP does not change.

What is the new angle of incidence?

- A**  $30^\circ$       **B**  $40^\circ$       **C**  $50^\circ$       **D**  $60^\circ$

[Turn over

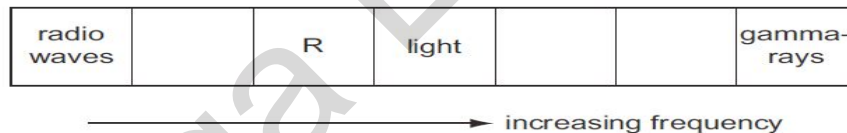
23 The diagram shows rays of light.



What is in the space labelled X?

- A a converging lens
- B a diverging lens
- C a plane mirror
- D a rectangular glass block

24 The diagram shows the main sections of the electromagnetic spectrum in order of increasing frequency. Some of the sections are labelled.



The section R has a frequency just below that of light.

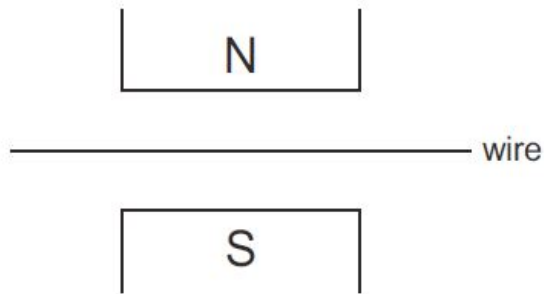
Which application uses the section R?

- A killing cancerous cells
- B satellite television
- C sterilisation
- D television remote controller

25 Which row gives the speed of sound in air, in water and in steel?

	<u>speed in air</u> m/s	<u>speed in water</u> m/s	<u>speed in steel</u> m/s
A	330	1500	6000
B	330	6000	1500
C	6000	330	1500
D	6000	1500	330

26 A wire is placed in the magnetic field between the poles of a magnet, as shown.

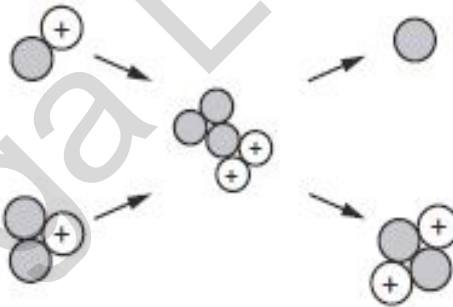


When there is a current in the wire, it experiences a force.

Which change increases the size of this force?

- A reverse both the direction of the current and the poles of the magnet
- B reverse just the direction of the current
- C use a stronger magnet
- D use a thicker wire with the same current

27 The diagram shows a nuclear reaction.



The shaded particles are uncharged.

What are the products shown in this reaction?

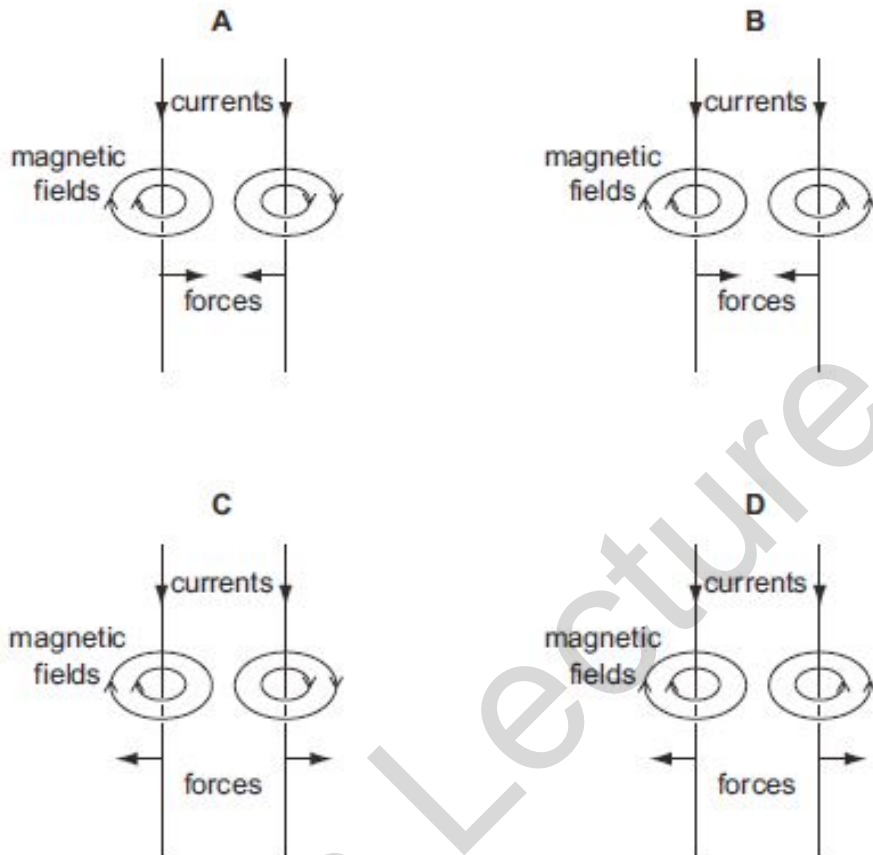
- A a helium atom and a neutron
- B a helium atom and a proton
- C a helium nucleus and a neutron
- D a helium nucleus and a proton

[Turn over



28 Two parallel wires carry currents in the same direction.

Which diagram shows the magnetic field around each wire and the direction of the force on each wire?

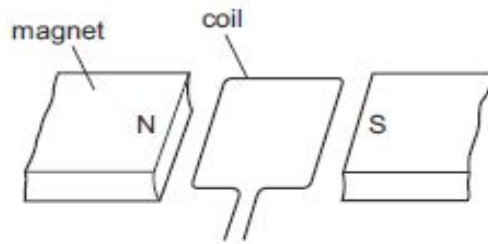


29 What is the correct unit for the quantity shown?

	quantity	unit
<b>A</b>	electromotive force (e.m.f.)	N
<b>B</b>	latent heat	J
<b>C</b>	pressure	kg / m <sup>3</sup>
<b>D</b>	weight	kg

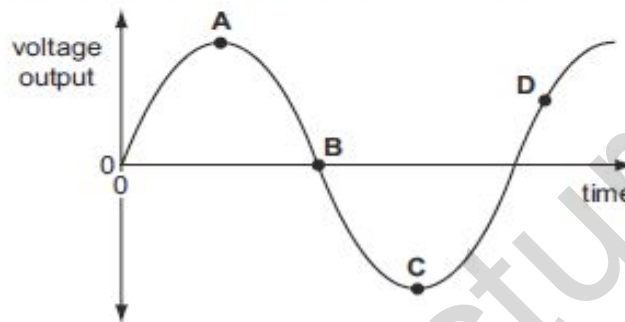


30 The diagram shows part of an a.c. generator when its coil is in a horizontal position.



The graph shows the voltage output plotted against time.

Which point on the graph shows when the coil is in a vertical position?

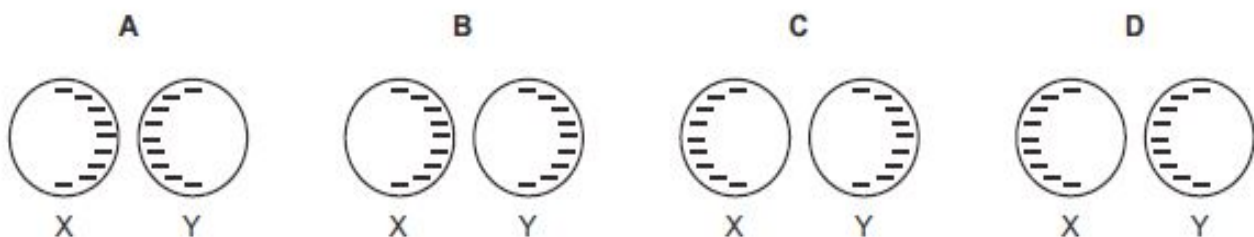


31 Two metal spheres X and Y are on insulating bases. Both spheres are negatively charged.



Sphere X is moved towards sphere Y until they almost touch.

Which diagram shows the final pattern of charges?



[Turn over

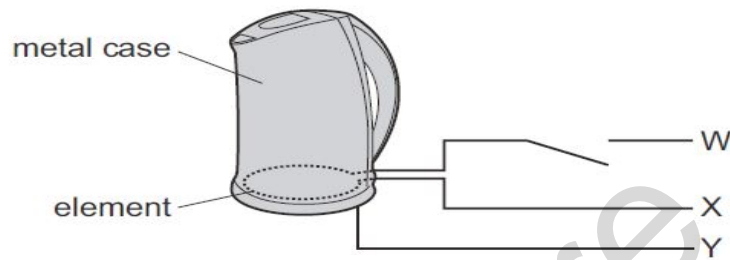
32 A school keeps radioactive sources for use in radioactivity experiments in a laboratory.

The background radiation is measured at the start of an experiment.

Which statement is correct?

- A The background radiation is caused by the school's radioactive sources in the laboratory.
- B The background radiation is present when there are no radioactive sources in the laboratory.
- C The background radiation is radiation that is not detected in radioactivity experiments.
- D The background radiation is the same in laboratories in different countries.

33 The diagram represents part of a household circuit containing an electric kettle.

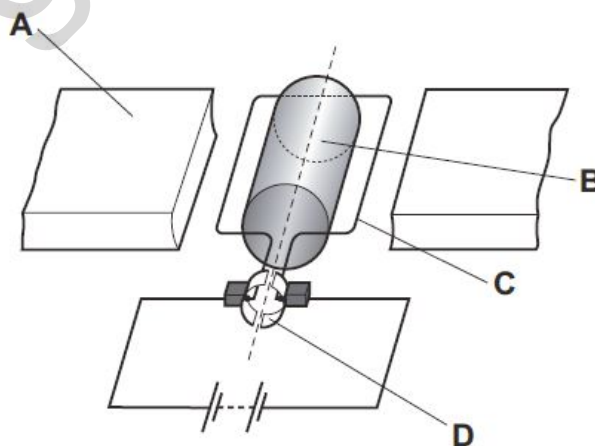


Which row correctly identifies the wires W, X and Y?

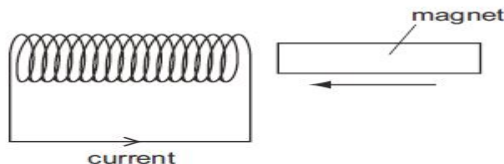
	W	X	Y
<b>A</b>	earth	live	neutral
<b>B</b>	live	neutral	earth
<b>C</b>	live	earth	neutral
<b>D</b>	neutral	live	earth

34 The diagram shows a simple d.c. motor.

Which labelled part is the commutator?



35 A magnet is pushed slowly into a coil and there is a current in the coil in the direction shown.



The magnet is then pulled out quickly from the same end of the coil.

What happens to the direction and the size of the current?

	direction	size
<b>A</b>	reversed	decreased
<b>B</b>	reversed	increased
<b>C</b>	unchanged	decreased
<b>D</b>	unchanged	increased

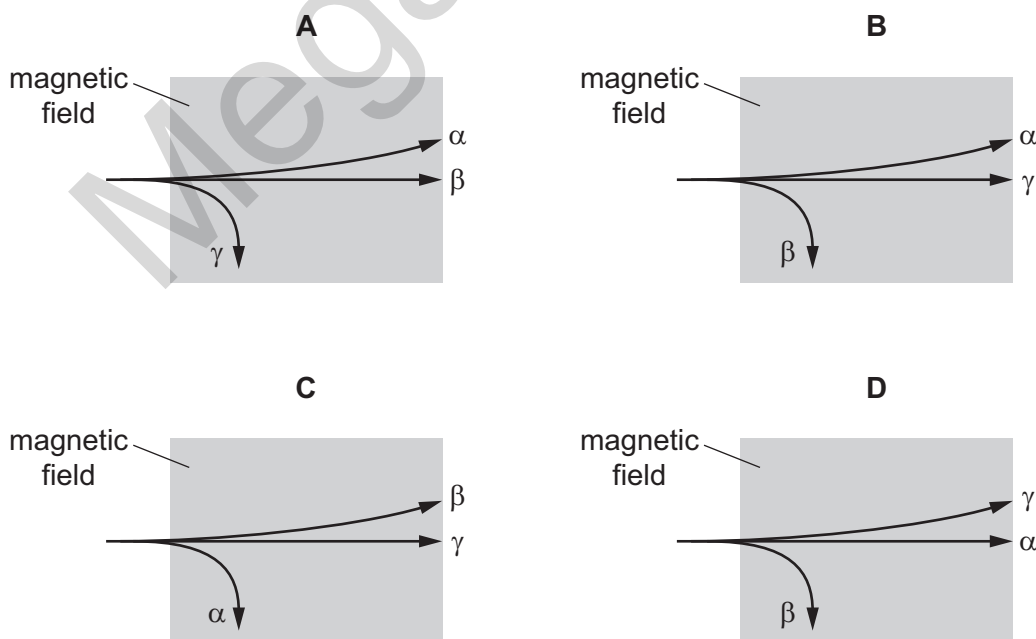
36 When dealing with radioactive materials there are possible dangers.

Which statement is correct?

- A** Beta-particles can pass through skin and damage body cells.
- B** Materials that emit only alpha-particles must be kept in thick lead containers.
- C** Radioactive materials are safe to handle after two half-lives.
- D** Sources of gamma radiation are dangerous because they have long half-lives.

37 A beam, consisting of alpha-particles ( $\alpha$ ), beta-particles ( $\beta$ ), and gamma rays ( $\gamma$ ), passes into a magnetic field.

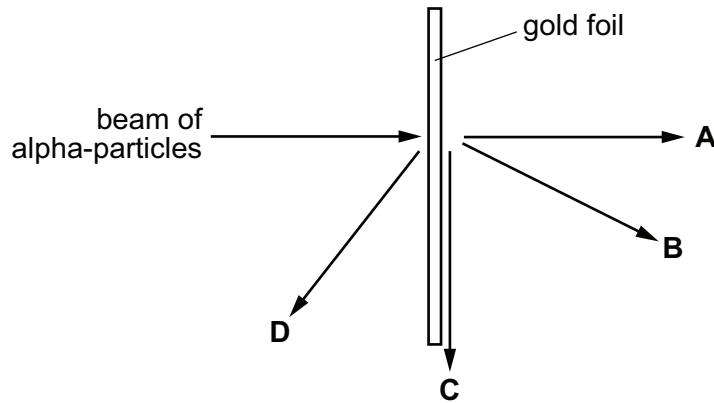
Which diagram shows their paths in the magnetic field?



[Turn over

38 A narrow beam of alpha-particles is fired at a thin piece of gold foil.

What is the final direction of the largest number of alpha-particles?

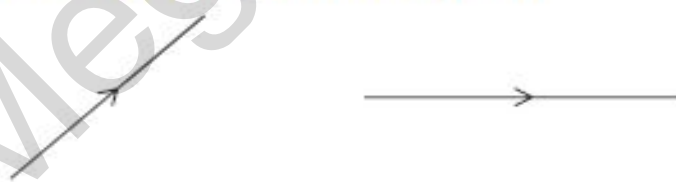


39 A nucleus of phosphorus  $^{32}_{15}\text{P}$  emits a beta-particle to form a new nucleus.

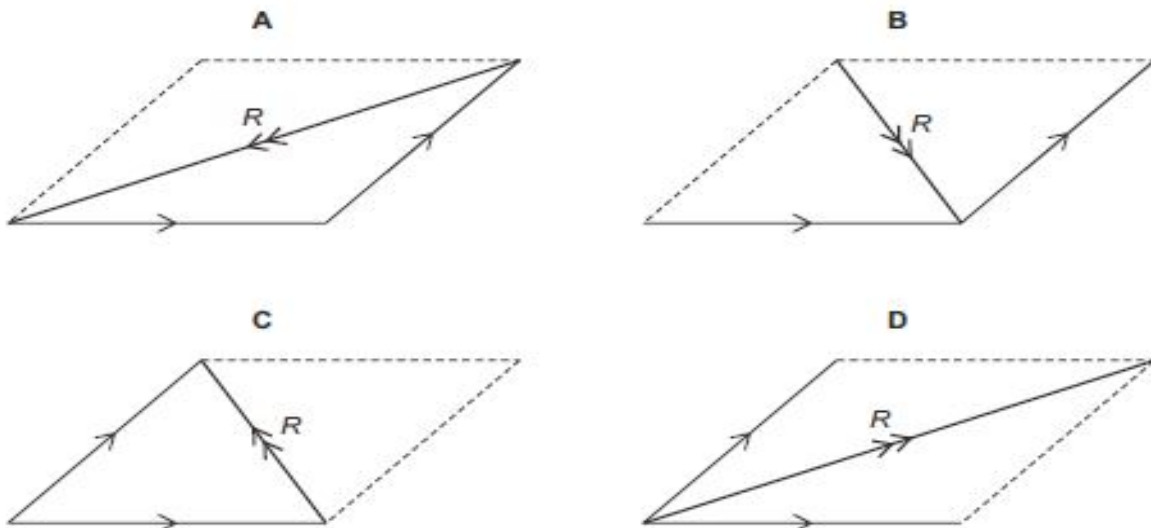
What is the nucleon number and what is the proton number of the new nucleus?

	nucleon number (mass number)	proton number (atomic number)
<b>A</b>	28	13
<b>B</b>	31	14
<b>C</b>	31	15
<b>D</b>	32	16

40 The diagram shows arrows representing two vector quantities.



Which diagram shows the resultant  $R$  of these two vectors?



**Marking Key**

1. C
2. D
3. D
4. C
5. D
6. A
7. B
8. C
9. A
10. C
11. D
12. C
13. B
14. A
15. C
16. B
17. D
18. C
19. A
20. C
21. B
22. C
23. D
24. D
25. A
26. C
27. C
28. A
29. B
30. B
31. C
32. D
33. B
34. D
35. A
36. A
37. B
38. A
39. D
40. C