Cambridge Assessment International Education

Supplementary Multiple-Choice Answer Sheet

Candidate number		**Candidate name**	
Centre number		**Name of exam**	
Exam series		**Supervisor**	
Syllabus code		**Syllabus title**	
Component code			

If the candidate is **absent** or has **withdrawn** shade here ☐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	■	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)

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.

1 Which statement about electromagnetic waves is correct?

A All electromagnetic waves have speeds in air of approximately 3×10^8 m/s.

B In air, some electromagnetic waves travel faster than light.

C The electromagnetic waves with the largest wavelength are in the infra-red region.

D The electromagnetic waves with the smallest wavelength are in the X-ray region.

2 A student wishes to measure directly the circumference of a football.

Which is the most suitable instrument to use?

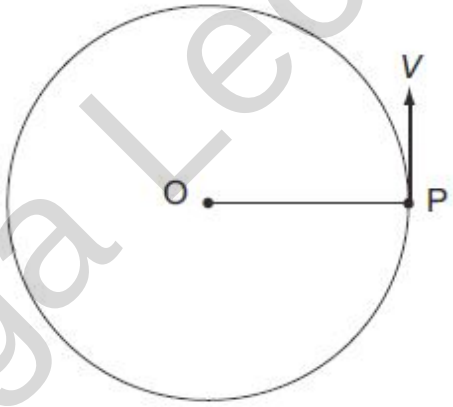
A calipers

B a measuring tape

C a micrometer

D a ruler

3 A particle P is moving in a horizontal circle about O. It moves at constant speed *V*.



Which statement is true?

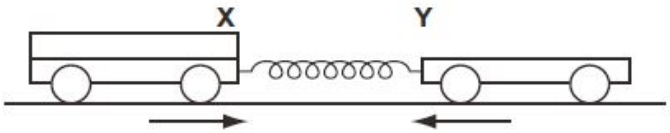
A A force of constant size is acting in the direction of *V*.

B A force of constant size is acting towards O.

C The force on P varies in size as it moves around the circle.

D There are no forces acting on P.

4 Trolley **X** and trolley **Y** are joined by a stretched spring. Trolley **X** has twice the mass of trolley **Y**.

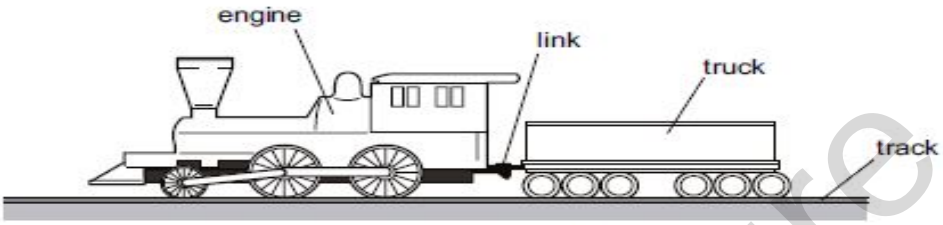


When the trolleys are released, the acceleration of **X** is $2\,m/s^2$ to the right.

What is the initial acceleration of trolley **Y** to the left?

A $1\,m/s^2$ **B** $2\,m/s^2$ **C** $3\,m/s^2$ **D** $4\,m/s^2$

5 An engine pulls a truck at constant speed on a level track.



The link between the engine and the truck breaks. The driving force on the engine remains constant.

What effect does this have on the engine and on the truck?

	engine	truck
A	speed stays constant	slows down
B	speeds up	slows down
C	speed stays constant	stops immediately
D	speeds up	stops immediately

6 What happens to an object when it is moved to a location where the gravitational field strength is slightly greater?

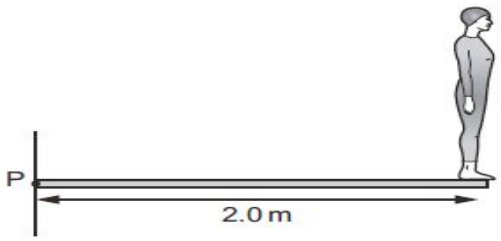
A Its density decreases.

B Its mass decreases.

C Its weight increases.

D Its volume increases.

7 A diver of weight 500 N stands at the end of a springboard that is 2.0 m long and is fixed at point P.



The springboard has a weight of 500 N. The centre of mass of the springboard is in the centre of the board.

What is the total moment about point P of the diver and the board?

A 500 N m **B** 750 N m **C** 1000 N m **D** 1500 N m

8 A tennis ball of mass 56 g is travelling at 1500 metres / minute.

Which expression is equal to the kinetic energy, in joules, of the tennis ball?

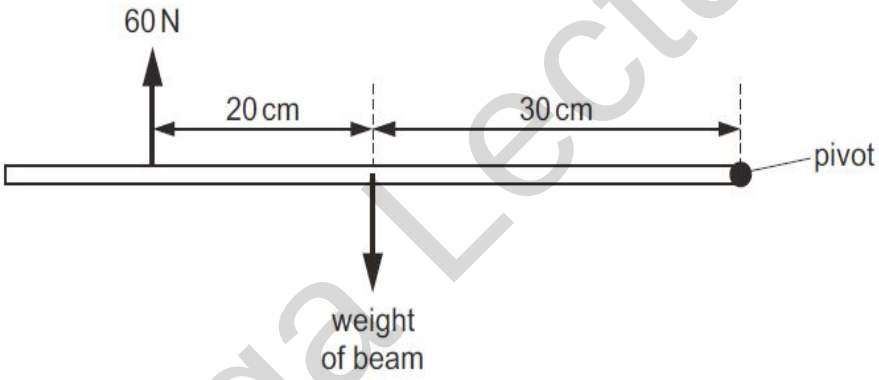
A $\frac{1}{2} \times 0.056 \times (25)^2$

B $\frac{1}{2} \times 0.056 \times (1500)^2$

C $\frac{1}{2} \times 56 \times (25)^2$

D $\frac{1}{2} \times 56 \times (1500)^2$

9 A uniform horizontal beam, pivoted at its right-hand end, is in equilibrium. A force of 60 N acts vertically upwards on the beam as shown.

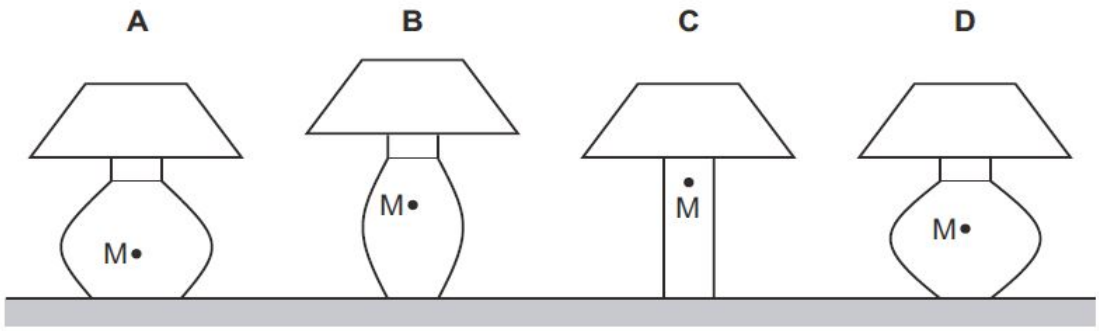


What is the weight of the beam?

A 36 N **B** 40 N **C** 90 N **D** 100 N

10 Four table lamps are shown along with the position M of the centre of mass in each case.

Which lamp is the most stable?



11 What does **not** affect the pressure at a point beneath the surface of a liquid?

A area of the liquid surface

B density of the liquid

C depth of the point below the surface

D strength of the gravitational field

12 A small table weighing 40 N stands on four legs, each having an area of 0.001 m^2.

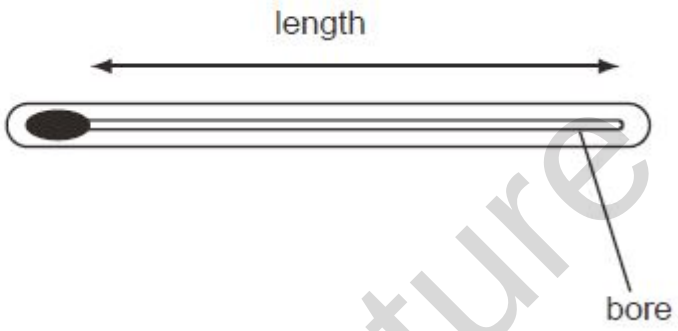
What is the pressure of the table on the floor?

A 400 N/m^2 **B** 1000 N/m^2 **C** 10 000 N/m^2 **D** 40 000 N/m^2

13 Which factors increase the rate of evaporation of a liquid?

	increasing its temperature	increasing its surface area	increasing its depth
A	yes	yes	yes
B	yes	yes	no
C	yes	no	yes
D	no	yes	yes

14 Four mercury-in-glass thermometers are made with different dimensions.



Which will have the greatest sensitivity?

A 10 cm long and bore 0.75 mm wide

B 15 cm long and bore 0.50 mm wide

C 25 cm long and bore 0.10 mm wide

D 30 cm long and bore 0.25 mm wide

15 According to the kinetic theory, matter is made up of very small particles in a constant state of motion.

Which row best describes the particle behaviour in the liquid state?

	forces between particles	motion of particles
A	strong	move randomly at high speed
B	strong	vibrate but are free to move position
C	strong	vibrate to and fro around a fixed position
D	weak	move randomly at high speed

16 To raise the temperature of a 2.0 kg block of metal by 20 °C, energy of 5.2 kJ is needed.

What is the value of the specific heat capacity of the metal?

A 0.13 J / (kg °C)

B 52 J / (kg °C)

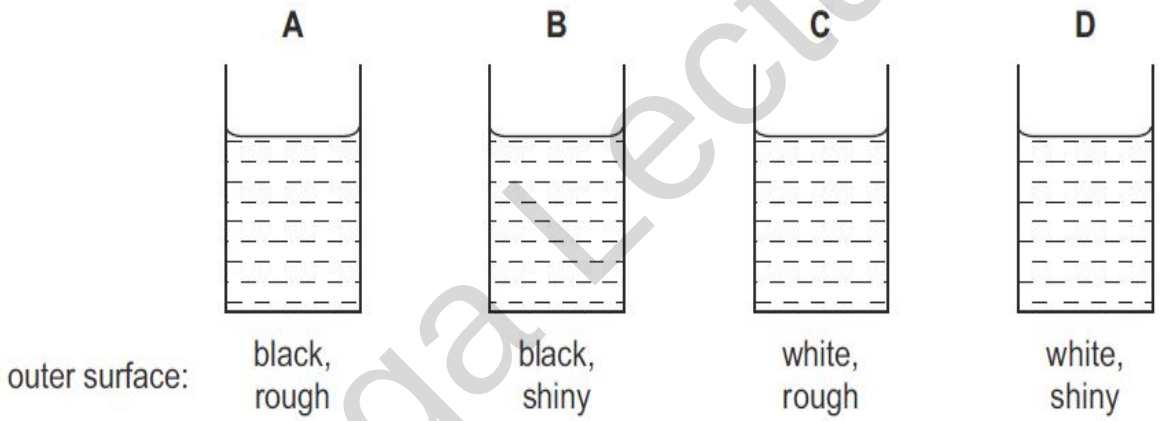
C 130 J / (kg °C)

D 52 000 J / (kg °C)

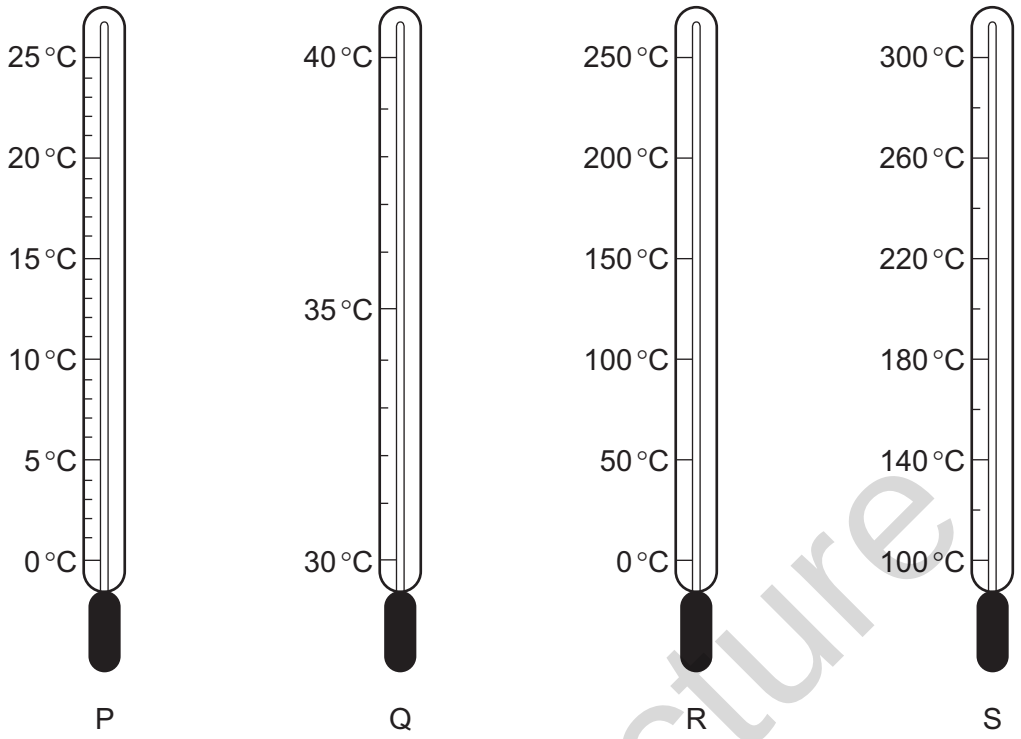
17 Four metal cans are identical except for the colour and the texture of their outer surfaces.

100 cm^3 of water at 70 °C is poured into each can.

Which cools the most rapidly?



18 The diagrams represent four thermometers.



Which thermometer has the greatest sensitivity and which thermometer has the greatest range?

	greatest sensitivity	greatest range
A	P	R
B	P	S
C	Q	R
D	Q	S

19 The diagrams show a bimetallic strip when it is at room temperature and after it has been cooled.

at room temperature below room temperature

The change in shape occurs because

A brass contracts more than invar.

B brass expands when it cools down.

C invar and brass contract by equal amounts.

D invar contracts more than brass.

20 Density changes are responsible for which method of thermal energy transfer?

A conduction only

B convection only

C radiation only

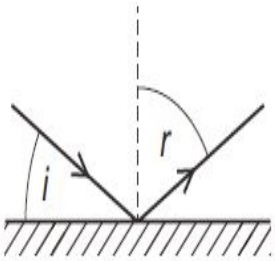
D conduction, convection and radiation

21 Light is incident on a mirror. The light is reflected from the mirror.

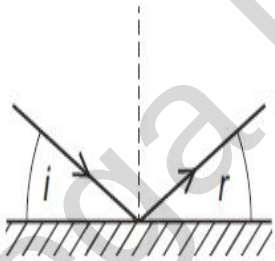
The angle of incidence is *i* and the angle of reflection is *r*.

Which diagram correctly shows *i* and *r*?

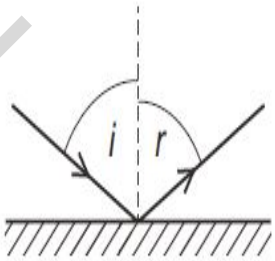
A



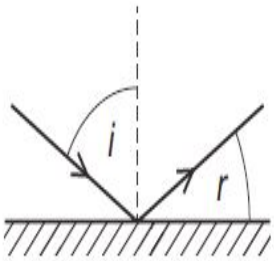
B



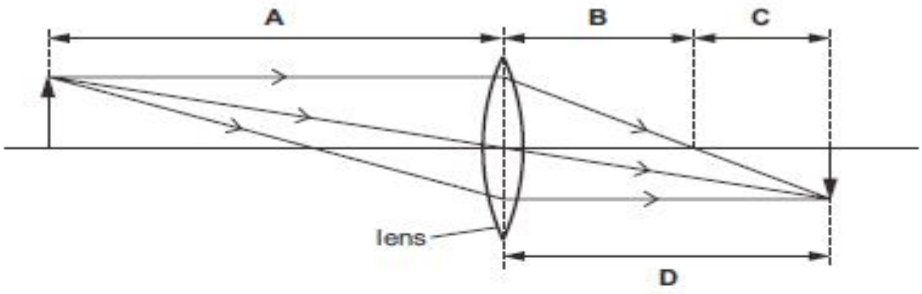
C



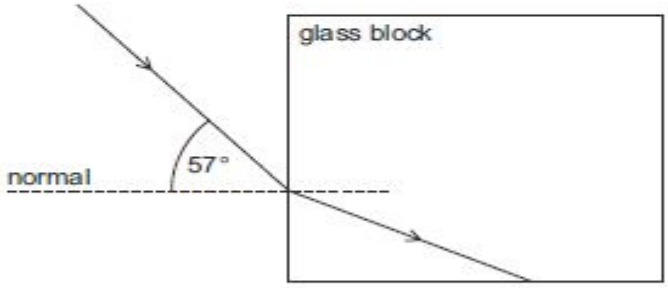
D



22 Which length is the focal length of the lens shown in the diagram?



23 Light passes from air into a glass block of refractive index 1.5, as shown.



What is the angle of refraction in the glass and what is the critical angle?

	angle of refraction	critical angle
A	34°	42°
B	34°	60°
C	38°	42°
D	38°	60°

24 Which statement is correct?

A Gamma rays have a longer wavelength than ultra-violet waves.

B Infra-red waves have a lower frequency than radio waves.

C Microwaves have a longer wavelength than visible light.

D X-rays have a higher speed in air than visible light.

25 A young person with healthy ears can hear a range of frequencies.

What is the approximate range of frequencies?

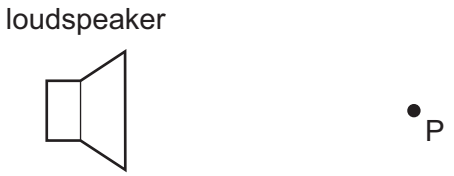
A 2 Hz to 2000 Hz only

B 2 Hz to 20 000 Hz only

C 20 Hz to 2000 Hz only

D 20 Hz to 20 000 Hz only

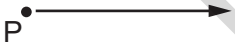
26 The diagram shows a loudspeaker that is producing a continuous sound wave of frequency 200 Hz in air.



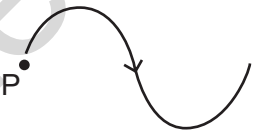
Which diagram best shows how the sound wave causes a molecule at P to move during $\frac{1}{200}$ s ?

A

B



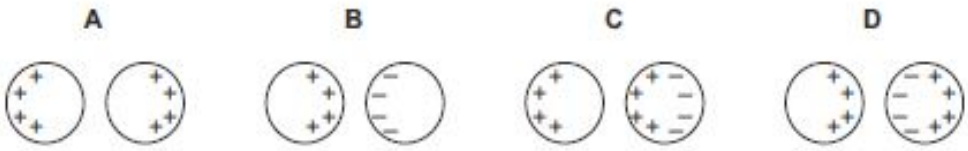
C



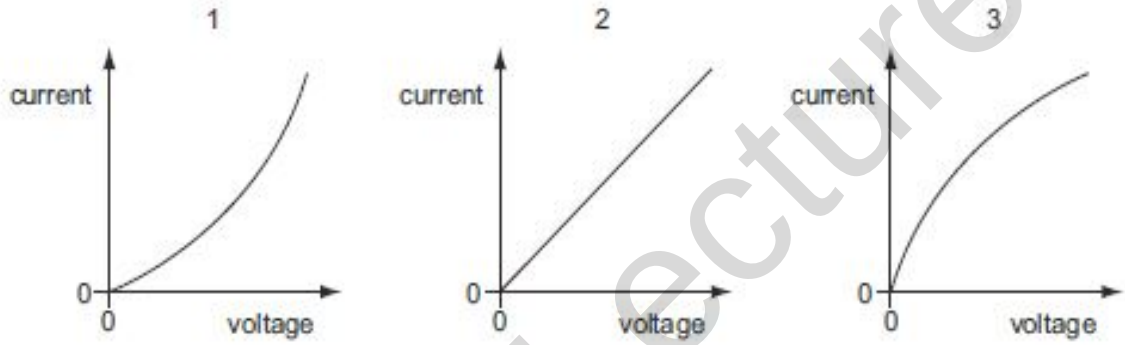
D

27 A positively-charged insulated metal sphere is brought close to, but does not touch, a similar uncharged metal sphere.

Which diagram shows the charge distribution on the spheres?



28 The current/voltage graphs are for different electrical components.



Which graph is for a resistor at constant temperature and which is for a filament lamp?

	resistor	lamp
A	1	2
B	2	1
C	2	3
D	3	2

29 Which of the following would cost the **least** if operated from the same voltage supply?

A a 5000 W electric cooker used for 1 minute

B a 1000 W electric fire used for 10 minutes

C a 500 W electric iron used for 1 hour

D a 100 W lamp used for 1 day

30 A house-owner replaces a failed fuse for the lights of the house. When the lights are switched on, the second fuse also fails. The house-owner then uses a third fuse with a higher rating than the previous two.

Why is this **not** a sensible thing to do?

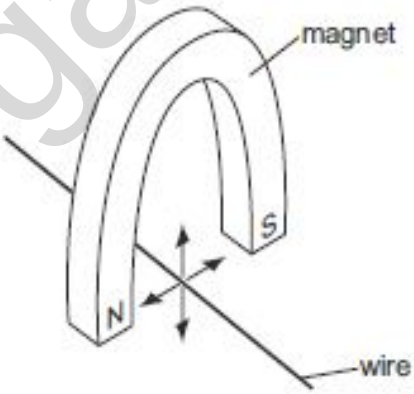
A Fuses only allow the circuit to work if the rating is exactly right.

B The third fuse will melt because the rating is too high.

C Using a fuse with too high a rating causes electric shocks.

D The circuit may work, but the fault is not corrected.

31 A copper wire is held between the poles of a magnet.

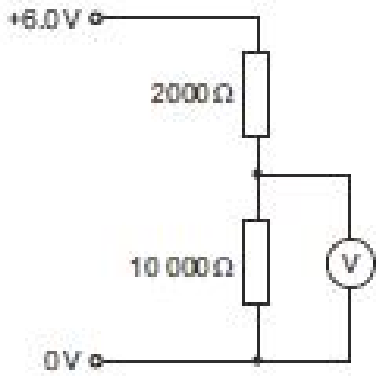


The current in the wire can be reversed. The poles of the magnet can also be changed over.

In how many of the four directions shown can the force act on the wire?

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

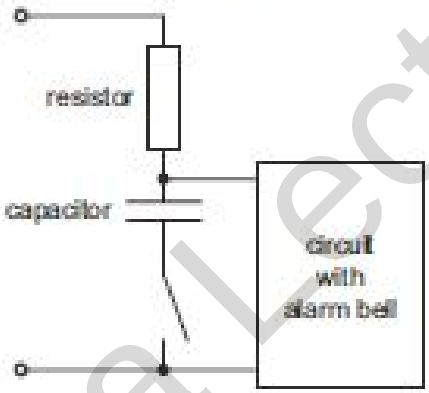
32 The diagram shows a potential divider system of two resistors connected to a 6.0 V power supply.



What is the reading on the voltmeter?

A 1.0 V **B** 1.2 V **C** 3.0 V **D** 5.0 V

33 In the circuit shown, the alarm bell will only start ringing some time after the switch is closed.



What causes the time delay?

A the capacitor charging

B the capacitor discharging

C the resistor cooling down

D the resistor heating up

34 Which device uses the force experienced by a current in a magnetic field when in normal use?

A cathode-ray oscilloscope

B electrostatic precipitator

C loudspeaker

D transformer

35 Electric power cables transmit electrical energy over large distances using high-voltage, alternating current.

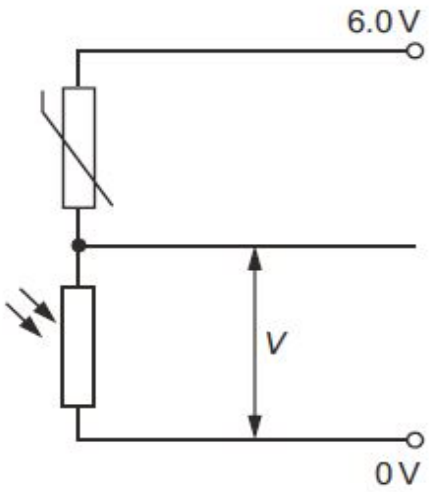
What are the advantages of using a high voltage and of using an alternating current?

	advantage of using a high voltage	advantage of using an alternating current
A	high current is produced in the cable	the resistance of the cable is reduced
B	high current is produced in the cable	the voltage can be changed using a transformer
C	less energy is wasted in the cable	the resistance of the cable is reduced
D	less energy is wasted in the cable	the voltage can be changed using a transformer

36 Which component, when used in a circuit, allows current to pass in only one direction?

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

37 A potential divider consists of a thermistor and a light-dependent resistor (LDR).



Which conditions give the smallest voltage *V* across the LDR?

A cold and dark

B cold and light

C hot and dark

D hot and light

37 What does the alpha-radiation given off by radioactive nuclei consist of?

A fast-moving protons

B helium nuclei

C microwaves

D radio waves

38 Which statement about the reactor in a nuclear power station is correct?

A In the reactor, the main reaction occurs when protons hit uranium nuclei.

B The process taking place in the reactor is called nuclear fusion.

C The reactor produces energy to boil water and to produce steam.

D Carbon dioxide is the major waste product from the reactor.

39 The results of the alpha-particle scattering experiment gave evidence for which of the following?

A nuclear fusion

B radioactive decay

C the existence of isotopes

D the nuclear atom

40 Which statement about two different isotopes of the same element is correct?

A Both isotopes have the same number of electrons in a nucleus.

B Both isotopes have the same number of protons in a nucleus.

C Both isotopes have the same number of neutrons in a nucleus.

D Both isotopes have the same number of nucleons in a nucleus.

Marking Key

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

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