



Cambridge IGCSE™ (9–1)

CO-ORDINATED SCIENCES

0973/21

Paper 2 Multiple Choice (Extended)

May/June 2026

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- 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 multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.
- Take the weight of 1.0 kg to be 9.8 N (acceleration of free fall = 9.8 m/s^2).

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

This document has **20** pages. Any blank pages are indicated.

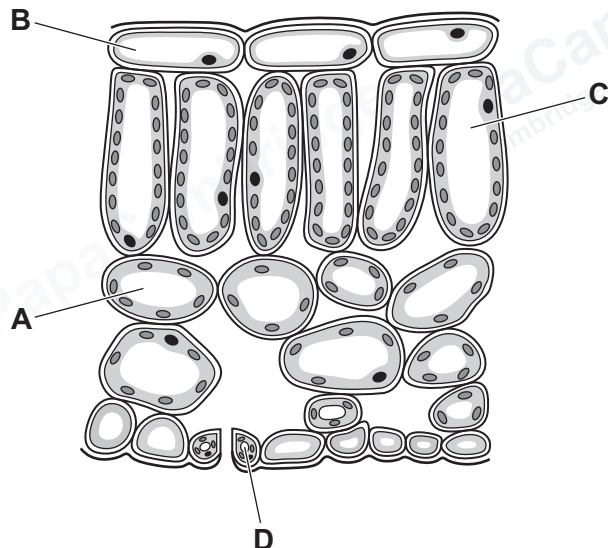
1 Which row describes the uptake of mineral ions from the soil?

	relative concentration of mineral ions in soil	relative concentration of mineral ions in root hair cell	method of transport into root hair cell	requires energy from respiration
A	low	high	active transport	yes
B	low	high	diffusion	no
C	high	low	active transport	no
D	high	low	diffusion	yes

2 Which statement correctly describes enzyme activity as the temperature increases up to an optimum temperature?

- A** The enzyme has less frequent effective collisions with the product.
- B** The enzyme has less frequent effective collisions with the substrate.
- C** The enzyme has more frequent effective collisions with the product.
- D** The enzyme has more frequent effective collisions with the substrate.

3 Which cell in a plant leaf controls gas exchange?



4 Which component of a balanced diet is a source of energy?

- A** carbohydrates
- B** minerals
- C** vitamins
- D** water

5 What is a function of bile?

- A assimilation of proteins
- B chemical digestion of carbohydrates
- C emulsification of fats
- D lubrication of ingested food

6 What happens to plant cells when a plant wilts?

- A They gain water, decrease in turgor pressure and become flaccid.
- B They gain water, increase in turgor pressure and become turgid.
- C They lose water, increase in turgor pressure and become turgid.
- D They lose water, decrease in turgor pressure and become flaccid.

7 Platelets are a component of blood.

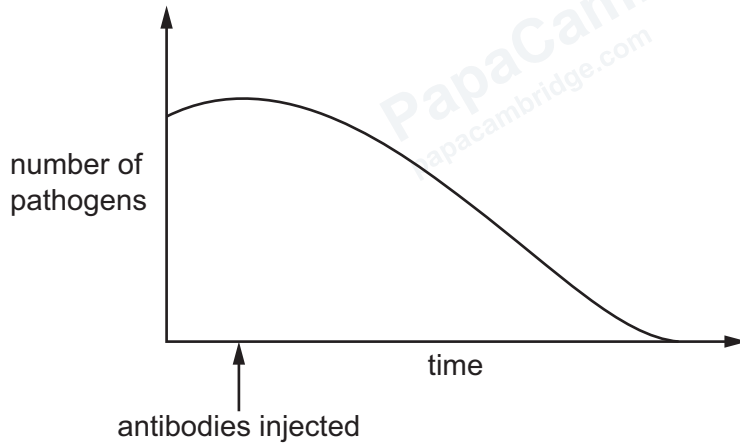
What is a function of platelets?

- A antibody production
- B clotting
- C transport of nutrients
- D transport of oxygen

- 8 A person is infected with a pathogen.

Antibodies are injected into the person to treat the infection.

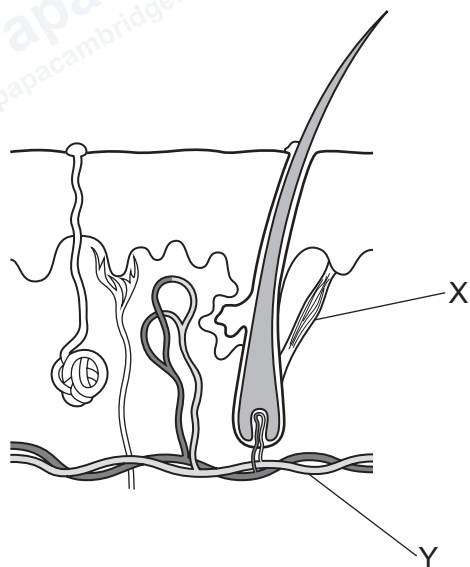
The graph shows the number of pathogens present in the blood of this person.



What is a possible explanation for the shape of the graph?

- A** The antibodies bind to antigens on the pathogens directly destroying the pathogens.
 - B** The antibodies bind to the pathogens making it easier for lymphocytes to engulf and destroy them.
 - C** The antibodies cause the production of memory cells so the patient becomes immune.
 - D** The antibodies have the same antigens as the pathogen and stimulate an immune response.
- 9 Which statement about diffusion of gases in the lungs is correct?
- A** Carbon dioxide diffuses from alveoli into blood capillaries.
 - B** Carbon dioxide diffuses from bronchi into blood capillaries.
 - C** Oxygen diffuses from alveoli into blood capillaries.
 - D** Oxygen diffuses from bronchi into blood capillaries.

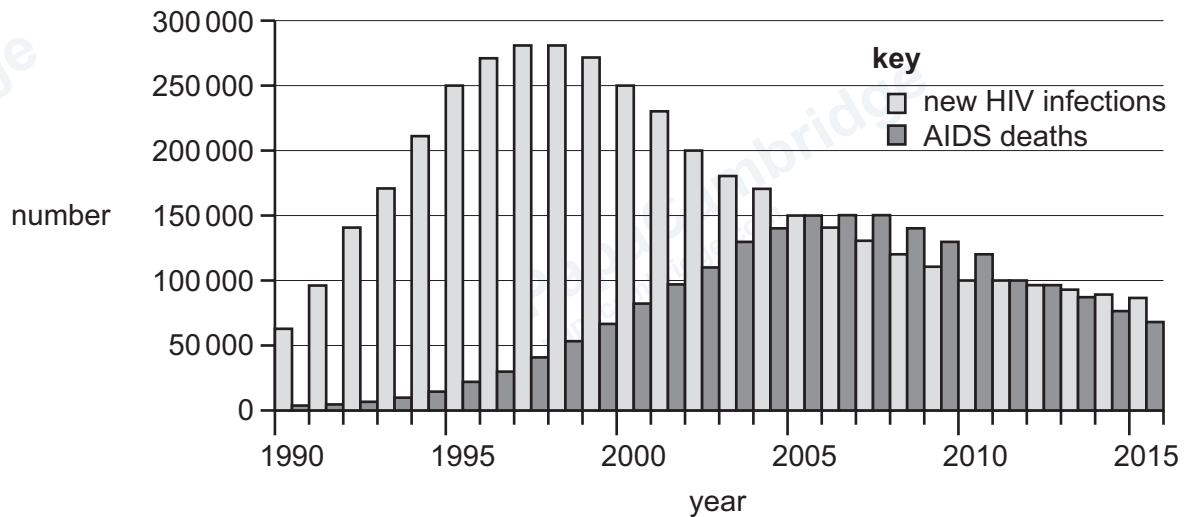
10 The diagram shows a cross-section of skin in a mammal.



Which row shows the responses of parts X and Y when the environmental temperature increases?

	X	Y
A	contracts	constricts
B	contracts	dilates
C	relaxes	constricts
D	relaxes	dilates

11 The graph shows the number of new HIV infections and AIDS deaths in a country.



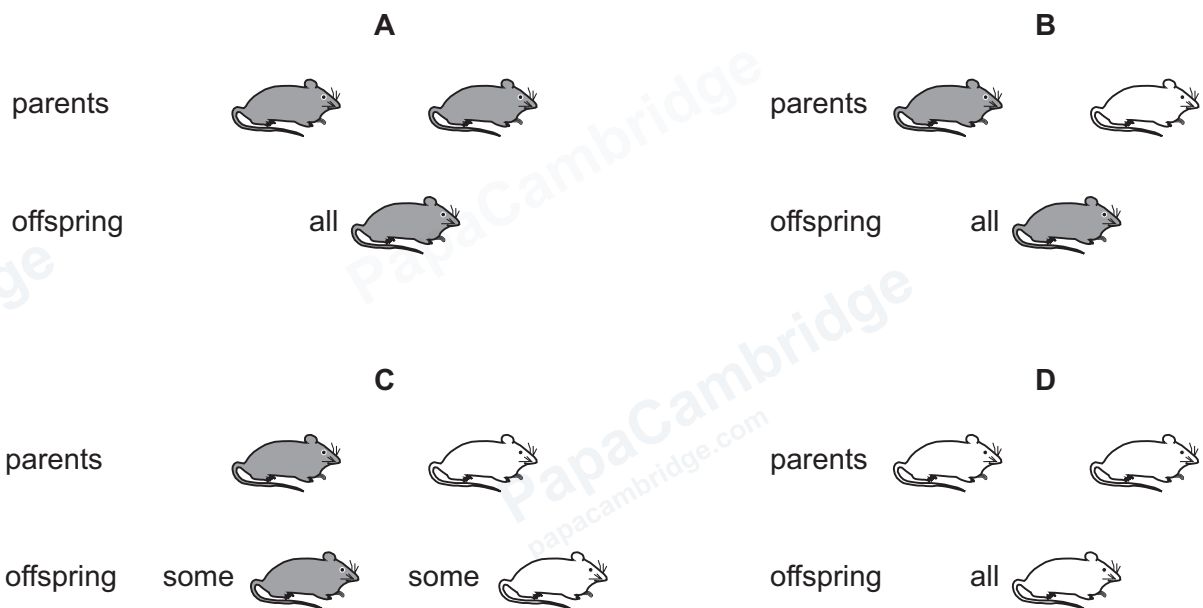
Which statements can be concluded from the graph?

- 1 The number of AIDS deaths peaks in 2006–2008.
- 2 The number of AIDS deaths peaks at 150 000.
- 3 The number of new HIV infections peaks in 1997–1998.
- 4 The number of new HIV infections is always greater than the number of AIDS deaths.

A 1, 2 and 3 **B** 1, 3 and 4 **C** 2 and 3 only **D** 2 and 4

12 The diagrams show some crosses between mice.

Which cross indicates that the allele for grey fur **must** be dominant to the allele for white fur?



13 What are undesirable effects of deforestation?

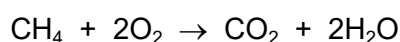
- 1 increase of carbon dioxide in the atmosphere
- 2 extinction of species
- 3 flooding
- 4 increased number of habitats

- A** 1, 2, 3 and 4
B 1, 2 and 3 only
C 1, 2 and 4 only
D 3 and 4 only

14 Which statement describes what happens to the particles in a solid when it melts?

- A** They are no longer in fixed positions because the forces between them are completely overcome.
B They are no longer in fixed positions because the forces between them are partially overcome.
C They move further apart and do **not** touch because the forces between them are completely overcome.
D They move further apart and do **not** touch because the forces between them are partially overcome.

15 The equation for the complete combustion of methane is shown.



What is the volume of oxygen, at room temperature and pressure, that is required for the complete combustion of 16 g of methane?

- A** 12 dm³ **B** 24 dm³ **C** 32 dm³ **D** 48 dm³

16 Hexane is a simple molecular compound.

Sodium phosphate is an ionic compound.

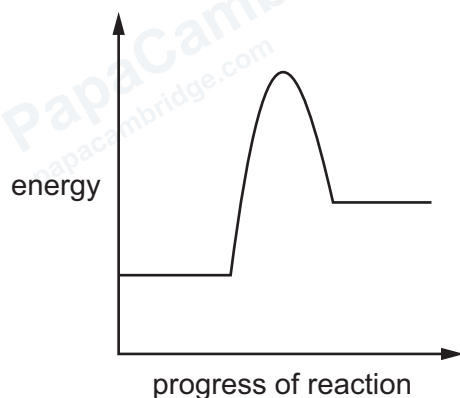
Which row describes the properties of hexane and sodium phosphate?

	hexane	sodium phosphate
A	high melting point	insoluble in water
B	low melting point	soluble in water
C	poor electrical conductivity	low boiling point
D	good electrical conductivity	high boiling point

17 Which substance produces hydrogen at the cathode during electrolysis?

- A aqueous copper(II) sulfate using copper electrodes
- B molten sodium chloride using carbon electrodes
- C dilute sulfuric acid using carbon electrodes
- D molten sodium hydroxide using platinum electrodes

18 An unlabelled reaction pathway diagram is shown.



Which row describes the reaction and gives a correct explanation?

	description of reaction	explanation
A	endothermic	the reactants contain less energy than the products
B	endothermic	the reactants contain more energy than the products
C	exothermic	the reactants contain less energy than the products
D	exothermic	the reactants contain more energy than the products

- 19** A student adds excess zinc to a fixed volume of dilute sulfuric acid of concentration 1.0 mol/dm^3 at different temperatures.

Hydrogen gas is produced.

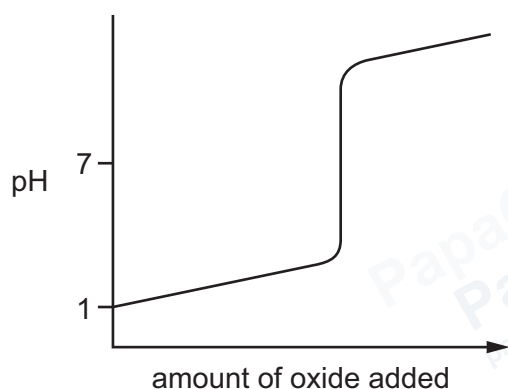
The results are shown.

experiment	temperature of sulfuric acid / °C	time for effervescence to end / s
1	30	240
2	40	120

Which statement about the rate of reaction in these experiments is correct?

- A** Experiment 1 has a higher rate because more collisions have an energy exceeding the activation energy and the frequency of collisions between particles is smaller.
- B** Experiment 2 has a higher rate because more collisions have an energy exceeding the activation energy and the frequency of collisions between particles is greater.
- C** Experiment 1 has a higher rate because the activation energy is lower at lower temperatures and the frequency of collisions between particles is greater.
- D** Experiment 2 has a higher rate because the activation energy is lower at higher temperatures and the frequency of collisions between particles is smaller.
- 20** An excess of an oxide of element Q is added to hydrochloric acid.

The graph shows how the pH changes during the addition of the oxide.



Which row describes the type of oxide and element Q?

	type of oxide	element Q
A	acidic	metal
B	acidic	non-metal
C	basic	metal
D	basic	non-metal

- 21 The halogen in Period 4 of the Periodic Table is a red-brown liquid at room temperature and pressure.

Which row describes the appearance of the halogens in Period 3 and Period 5?

	halogen in Period 3	halogen in Period 5
A	pale yellow-green gas	grey-black solid
B	pale yellow-green solid	grey-black solid
C	grey-black solid	pale yellow-green solid
D	grey-black solid	pale yellow-green gas

- 22 Which metal is used to galvanise steel?

- A** aluminium
B copper
C iron
D zinc

- 23 Which colour change is observed when water is added to anhydrous cobalt(II) chloride?

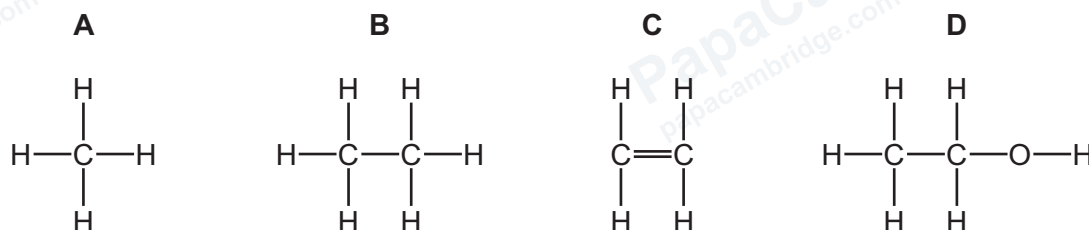
- A** blue to pink
B blue to white
C pink to blue
D white to blue

- 24 Which statements about carbon dioxide are correct?

- 1 Carbon dioxide in the atmosphere reduces the loss of thermal energy to space.
- 2 Carbon dioxide gas in the atmosphere causes acid rain.
- 3 Carbon dioxide is removed from car engine emissions using a catalytic convertor.

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 only **D** 2 and 3 only

- 25 Which diagram represents a molecule of ethane?



26 Which statements about addition polymers and condensation polymers are correct?

- 1 Alkanes and alkenes form addition polymers.
- 2 Addition polymerisation forms only one product.
- 3 Condensation polymerisation forms a polymer and a small molecule.
- 4 Poly(ethene) is a condensation polymer.

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

27 The results of two tests on aqueous M are shown.

- When aqueous sodium hydroxide is added to M, a red-brown precipitate is produced.
- When acidified aqueous barium nitrate is added to M, a white precipitate is produced.

What is M?

- A copper(II) chloride
B copper(II) sulfate
C iron(III) chloride
D iron(III) sulfate

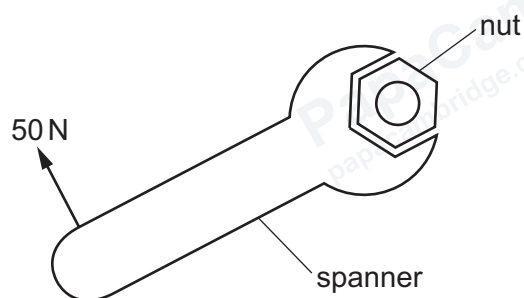
28 An object near the surface of the Earth is in free fall. The gravitational field strength is constant.

Which statement about the acceleration of the object is correct?

- A The acceleration is constant, but **not** zero.
B The acceleration is decreasing.
C The acceleration is increasing.
D The acceleration is zero.

- 29 A force is applied to the end of the handle of a spanner to turn a nut.

The minimum force needed to turn the nut with this spanner is 50 N.



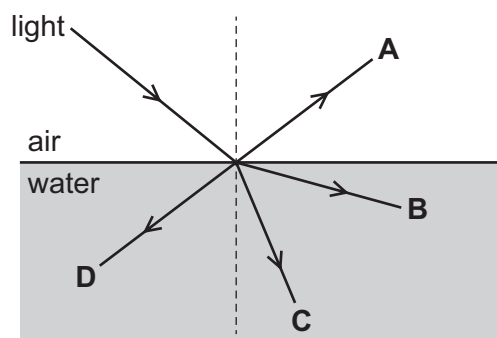
What is an advantage of using a spanner with a longer handle to turn the nut?

- A It decreases the minimum force needed to turn the nut.
 - B It increases the minimum force needed to turn the nut.
 - C It decreases the moment needed to turn the nut.
 - D It increases the moment needed to turn the nut.
- 30 Which type of energy does an object store due to its motion?
- A elastic
 - B gravitational potential
 - C kinetic
 - D nuclear
- 31 Which statement about boiling or evaporation of a liquid is correct?
- A Boiling occurs at any temperature.
 - B Boiling occurs only at the surface of the liquid.
 - C Evaporation occurs only at a specific temperature.
 - D Evaporation occurs only at the surface of the liquid.
- 32 A solid metal transfers energy by thermal conduction.
- What causes this transfer?
- A atomic lattice vibrations and movement of delocalised electrons
 - B atomic lattice vibrations only
 - C movement of delocalised electrons only
 - D change in density of the metal

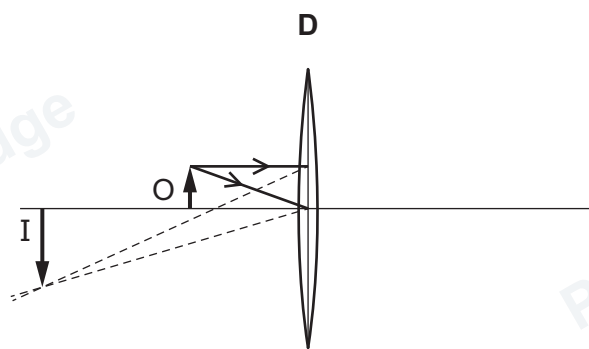
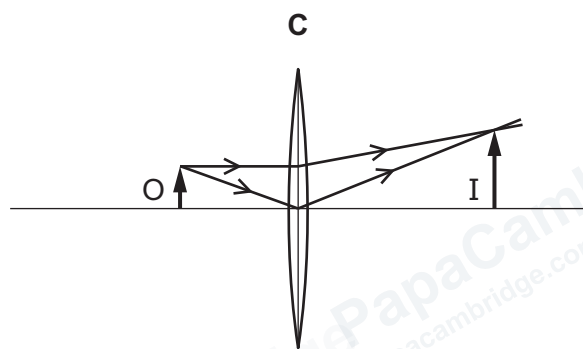
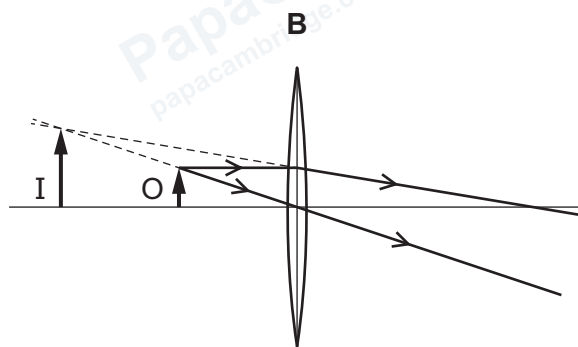
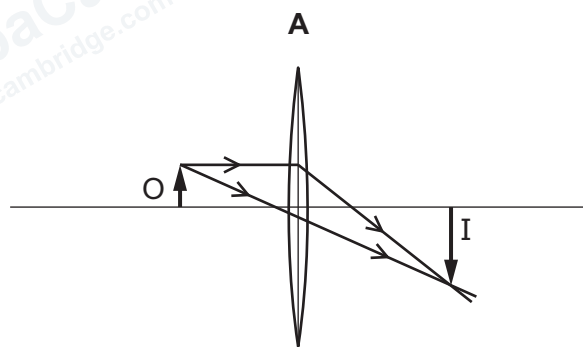
- 33 A ray of light in air is incident on the surface of water. The ray of light is refracted.

Light travels more slowly in water than in air.

In which labelled direction is the light refracted?



- 34 Which ray diagram represents the formation of a virtual image I of an object O by a thin converging lens?



- 35 A sound wave travels through air.

Which statement describes the behaviour of air particles as the sound wave travels?

- A Air particles move backwards and forwards in a rarefaction, but up and down in a compression.
- B Air particles move more slowly in a rarefaction than in a compression.
- C Air particles are further apart in a rarefaction than in a compression.
- D Air particles are in a region of higher pressure in a rarefaction than in a compression.

- 36 An electrician has a voltmeter that can be switched to different voltage ranges.

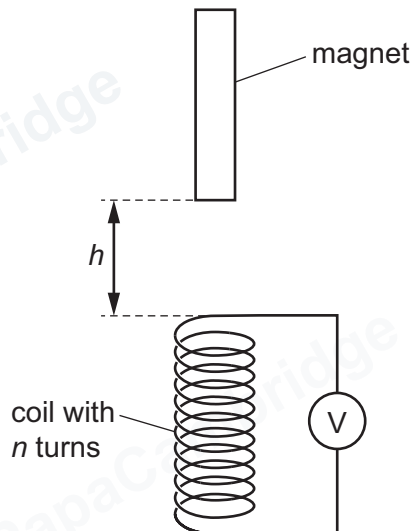
The voltmeter needs to measure a voltage of 240 V.

Which voltage range is the most suitable?

- A 0–1000 mV B 0–200 V C 0–500 V D 5–250 kV

- 37 A magnet is dropped through a coil from a height of h cm.

The coil has n turns and is connected to a voltmeter.

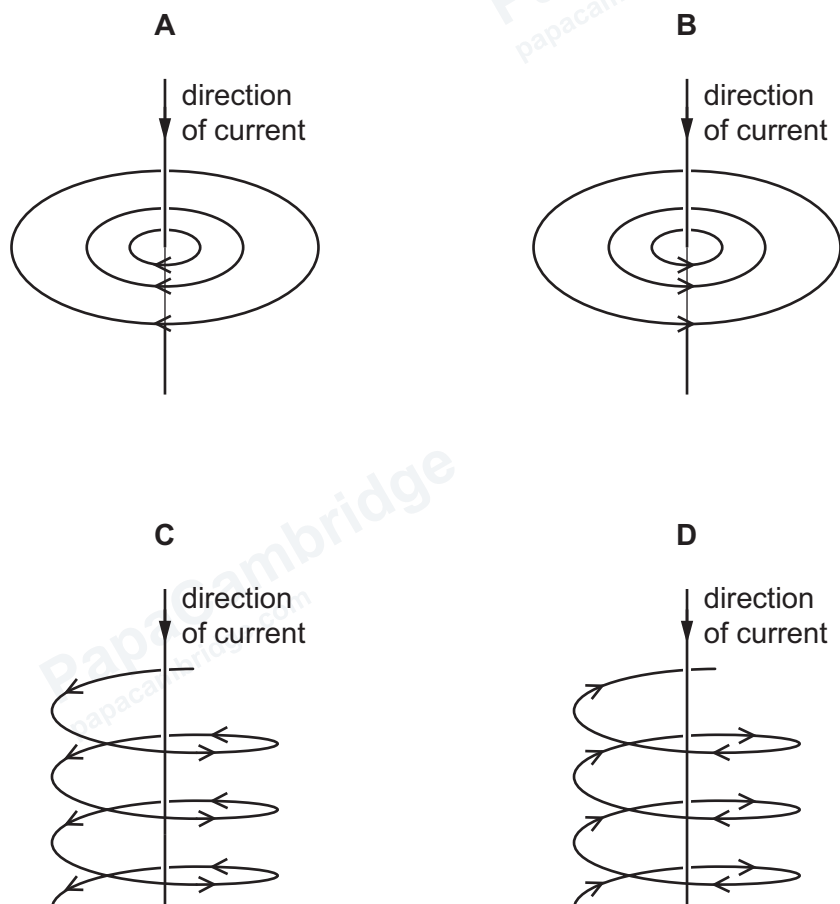


Which row gives the values of h and n that produce the greatest induced electromotive force (e.m.f.)?

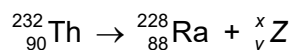
	h/cm	n
A	5	200
B	5	400
C	10	200
D	10	400

- 38 A straight wire carries a current. The direction of the current is shown.

Which diagram shows the pattern and direction of the magnetic field due to the current?



- 39 The decay equation for thorium-232 is shown.



What are the values of x and y and what is the identity of particle Z ?

	x	y	Z
A	1	2	beta
B	2	1	beta
C	2	4	alpha
D	4	2	alpha

- 40 A planet orbits the Sun once every 225 days. The radius of the orbit of the planet is 110 million km.

What is the orbital speed of the planet?

- A** 36 m/s **B** 85 m/s **C** 36 000 m/s **D** 85 000 m/s

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Group

Key

atomic symbol	name	relative atomic mass
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57	La	lanthanum	139	58	Ce	cerium	140	59	Pr	praseodymium	141	60	Nd	neodymium	144	61	Pm	promethium	—	62	Sm	samarium	150	63	Eu	euporium	152	64	Gd	gadolinium	157	65	Tb	terbium	159	66	Dy	dysprosium	163	67	Ho	holmium	165	68	Er	erbium	167	69	Tm	thulium	169	70	Yb	ytterbium	173	71	Lu	lutetium	175
89	Ac	actinium	—	90	Th	thorium	232	91	Pa	protactinium	231	92	U	uranium	238	93	Np	neptunium	—	94	Pu	plutonium	—	95	Am	americium	—	96	Cm	curium	—	97	Bk	berkelium	—	98	Cf	californium	—	99	Es	einsteinium	—	100	Fm	fermium	—	101	Md	mendelevium	—	102	No	nobelium	—	103	Lr	lawrencium	—

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).