



Cambridge IGCSE™

COMBINED SCIENCE

0653/11

Paper 1 Multiple Choice (Core)

May/June 2021

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.
- Do **not** write on any bar codes.
- You may use a calculator.

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 **16** pages. Any blank pages are indicated.



- 1 A drawing of a cell is 80 mm in length and the magnification is $\times 200$.

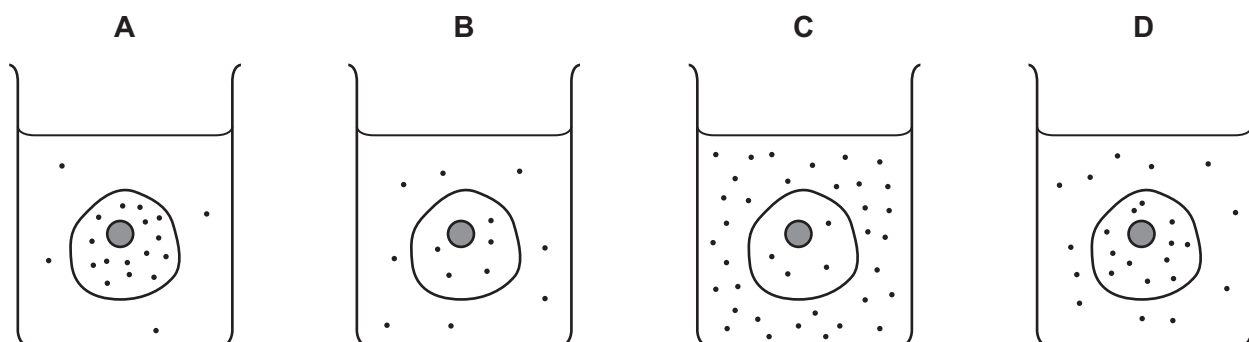
What is the actual size of the cell?

- A** 0.4 mm **B** 4.0 mm **C** 1.6 mm **D** 16.0 mm

- 2 The diagrams represent four similar animal cells immersed in blood plasma.

The black dots represent molecules of dissolved oxygen.

Which cell will have oxygen molecules diffusing into it most rapidly?

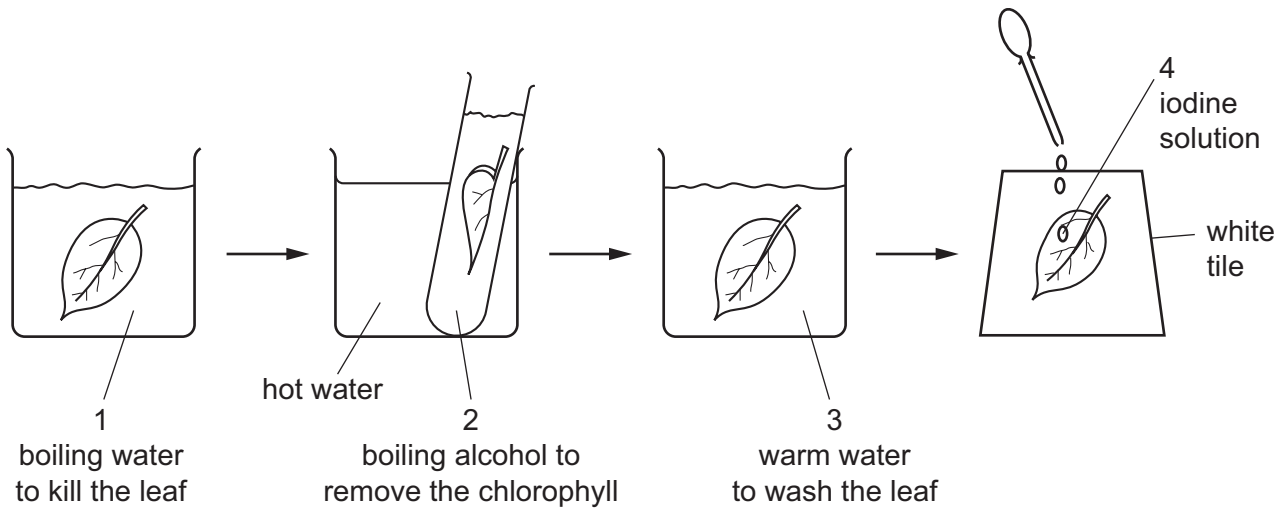


- 3 Which row shows the elements that occur in all proteins?

	carbon	hydrogen	nitrogen	oxygen
A	yes	yes	yes	no
B	yes	yes	no	yes
C	yes	no	yes	yes
D	yes	yes	yes	yes

4 The flow diagram shows the stages in testing a green leaf for starch.

1, 2, 3 and 4 are all liquids.



What are the colours of liquids 2 and 4 for a leaf that contains starch?

	2	4
A	green	blue / black
B	colourless	brown
C	colourless	blue / black
D	green	brown

5 A person is diagnosed with scurvy.

The table shows the content of vitamin C, vitamin D, calcium and iron in four different foods.

Which food should the person eat to help reduce scurvy?

	vitamin C / %	vitamin D / %	calcium / %	iron / %
A	0	6	72	3
B	88	0	4	0
C	3	0	5	10
D	0	54	12	15

- 6 This statement is about chemical digestion.

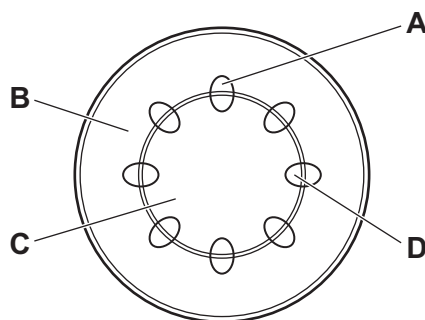
In the alimentary canal chemical digestion takes place in order to produce1..... ,2..... molecules so that they can be3..... .

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	large	insoluble	ingested
B	small	soluble	absorbed
C	large	soluble	egested
D	small	insoluble	absorbed

- 7 The diagram shows a cross-section of a plant stem.

Which label indicates the tissue responsible for the transport of water through the plant?



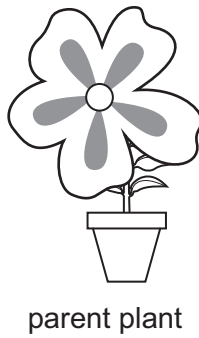
- 8 Which equation represents aerobic respiration?

- A** carbon dioxide + glucose $\rightarrow$ oxygen + water
B carbon dioxide + water $\rightarrow$ glucose + oxygen
C glucose + oxygen $\rightarrow$ carbon dioxide + water
D glucose + water $\rightarrow$ carbon dioxide + oxygen

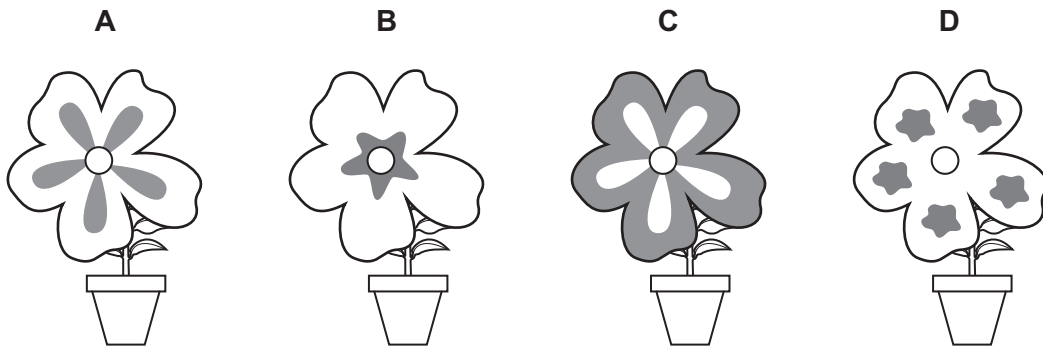
- 9 What are effects of increased adrenaline production in humans?

- A** increased rate of breathing and increased pulse rate
B increased rate of breathing and narrower pupils
C slower pulse rate and narrower pupils
D slower pulse rate and wider pupils

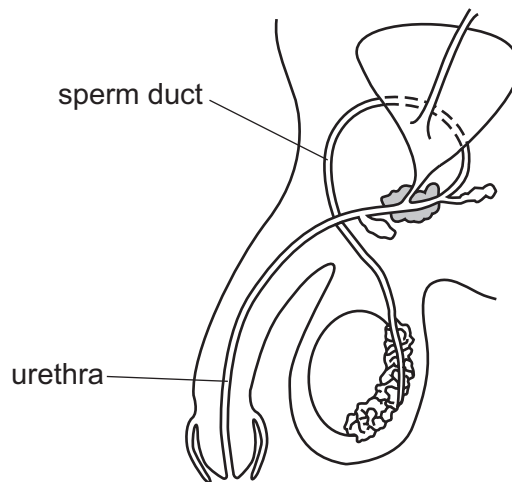
10 The diagram shows a parent plant.



Which offspring has been produced by asexual reproduction from this plant?



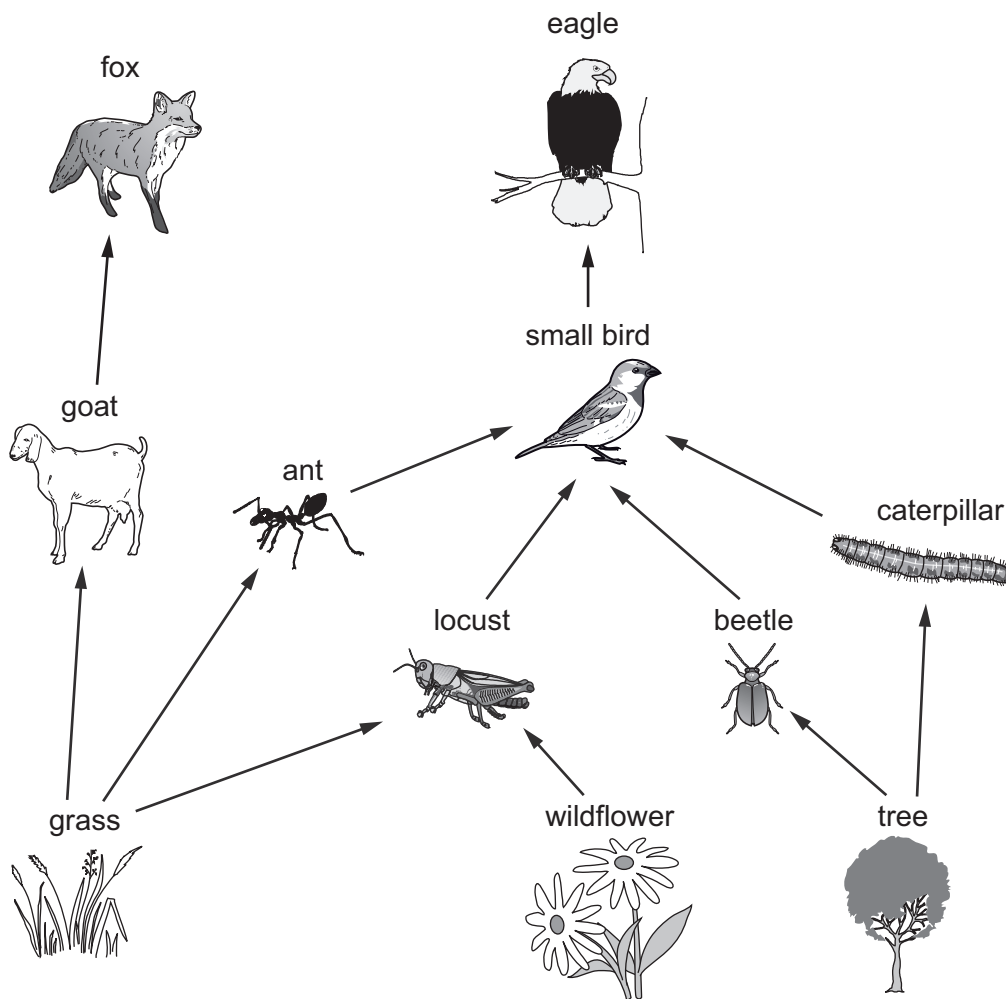
11 The diagram shows the male reproductive organs.



What is transported by the sperm duct and the urethra?

	sperm duct	urethra
A	sperm	semen and urine
B	sperm	urine only
C	urine	semen and urine
D	urine	semen only

12 The diagram shows a food web.



How many species are primary consumers in this food web?

- A** 2 **B** 3 **C** 4 **D** 5

13 Which process takes carbon dioxide out of the air?

- A** combustion
B decomposition
C photosynthesis
D plant respiration

- 14** A fixed mass of argon gas in a sealed container is heated.

The pressure inside the container increases.

Which statement explains why the pressure increases?

- A** There is an increase in the number of gaseous particles inside the container.
- B** There is an increase in the number of collisions per second between the particles of gas and the walls of the container.
- C** The particles of gas have less energy and collide with the wall of the container more frequently.
- D** There is a decrease in the space that the particles have to move in.
- 15** What is an example of a physical change?
- A** carbon dioxide turning limewater milky
- B** the crystallisation of copper(II) sulfate from solution
- C** the electrolysis of molten lead(II) bromide
- D** the thermal decomposition of calcium carbonate
- 16** Which row about elements and compounds is correct?

	elements	compounds
A	are metals only	contain ionic or covalent bonds
B	are non-metals only	contain covalent bonds only
C	are metals or non-metals	contain ionic bonds only
D	are metals or non-metals	contain ionic or covalent bonds

- 17** Dilute sulfuric acid is electrolysed using inert electrodes.

Which statement is correct?

- A** Hydrogen is produced at the anode.
- B** Both hydrogen and oxygen are produced at the negative electrode.
- C** Sulfur dioxide is produced at the cathode.
- D** Oxygen is produced at the positive electrode.

- 18 Some calcium carbonate and dilute hydrochloric acid start to react. Water is then added to the reaction mixture.

What happens to the rate of the reaction?

- A It decreases.
- B It increases.
- C It stays the same.
- D It stops.

- 19 Barium hydroxide is an alkali.

Which statement about barium hydroxide is correct?

- A It has a pH greater than 7 in aqueous solution.
- B It reacts with aqueous sodium hydroxide.
- C It reacts with metal carbonates.
- D It turns Universal Indicator red.

- 20 Which two substances form a white precipitate when they are mixed?

- A barium chloride and hydrochloric acid
- B barium chloride and nitric acid
- C silver nitrate and hydrochloric acid
- D silver nitrate and nitric acid

- 21 There are eight elements in Period 3 of the Periodic Table.

Na	Mg	Al	Si	P	S	Cl	Ar
----	----	----	----	---	---	----	----

Which statement about the elements in this period is correct?

- A The elements become less metallic across the period.
- B The most metallic elements are at both ends of the period.
- C The most metallic elements are in the middle of the period.
- D There is no pattern in metallic character across the period.

22 What are properties of transition elements?

- 1 They can act as catalysts.
- 2 They only form white compounds.
- 3 They have high densities.

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

23 Which words describe a noble gas?

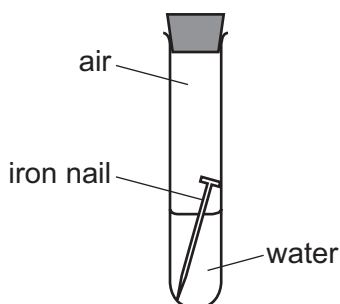
- A** compound, colourless, does not burn in air
- B** element, colourless, burns in air
- C** element, colourless, does not burn in air
- D** element, green, does not burn in air

24 Which substances conduct electricity when molten?

- 1 sodium chloride
- 2 naphtha
- 3 brass

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

25 An iron nail is left for a few days in a sealed test-tube containing air and water.



Which change in the air in the test-tube occurs as the iron nail rusts?

- A** The amount of carbon dioxide decreases.
- B** The amount of carbon dioxide increases.
- C** The amount of nitrogen increases.
- D** The amount of oxygen decreases.

26 Which type of compound contains only carbon and hydrogen?

- A carbohydrate
- B carbonate
- C hydrocarbon
- D hydroxide

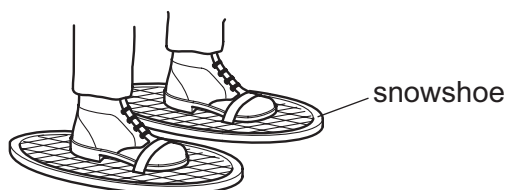
27 Which statement about ethene is **not** correct?

- A It is used to make an addition polymer.
- B It decolourises aqueous bromine.
- C It is a saturated hydrocarbon.
- D It is formed by cracking larger alkanes.

28 Which row shows apparatus used to measure length, time and volume?

	length	time	volume
A	measuring cylinder	metre rule	stop-clock
B	measuring cylinder	stop-clock	metre rule
C	metre rule	measuring cylinder	stop-clock
D	metre rule	stop-clock	measuring cylinder

29 Snowshoes make walking over snow easier than when wearing normal shoes.



Why do the snowshoes make it easier to walk over snow?

- A They decrease the pressure acting on the snow.
- B They decrease the weight acting on the snow.
- C They increase the pressure acting on the snow.
- D They increase the weight acting on the snow.

- 30** A boy runs up some stairs.

Which two physical quantities are used to calculate the power he develops?

- A** his mass and his acceleration
- B** his mass and the time taken
- C** the work done and the time taken
- D** the work done and the vertical distance moved

- 31** Which row contains a renewable and a non-renewable energy resource in the correct column?

	renewable	non-renewable
A	geothermal	wind
B	geothermal	coal
C	oil	wind
D	oil	coal

- 32** Cold water evaporates as molecules leave it.

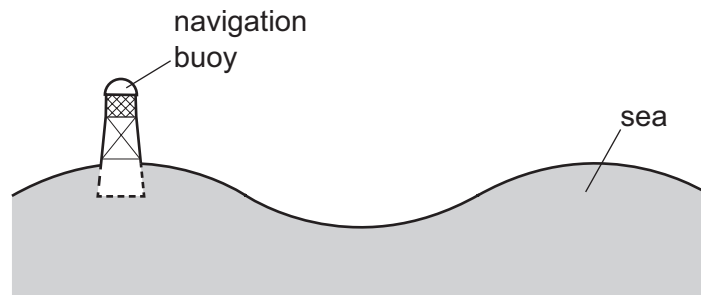
Which molecules leave the water and from which part of the water do they leave?

	molecules that leave the water	where they leave from
A	least energetic	the surface only
B	least energetic	throughout the water
C	most energetic	the surface only
D	most energetic	throughout the water

- 33** What is a property of infra-red radiation?

- A** It can only travel in a gas.
- B** It can only travel in a metal.
- C** It can only travel in liquids and gases.
- D** It can travel through a vacuum.

- 34** A navigation buoy floating on the sea oscillates up and down as a wave passes.



In 2.0 minutes, 6.0 wavelengths pass the buoy.

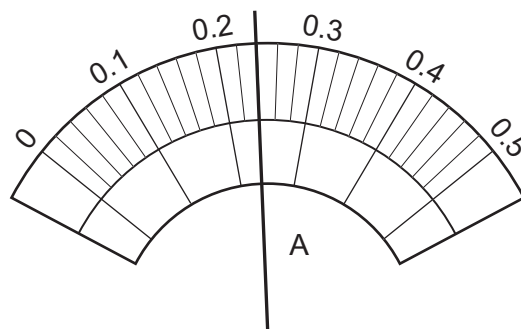
What is the frequency of the waves?

- A** 0.050 Hz **B** 0.33 Hz **C** 3.0 Hz **D** 20 Hz
- 35** Radio waves and gamma rays are travelling in a vacuum.

How do the frequency and speed of the radio waves compare with the frequency and speed of the gamma rays?

	frequency of radio waves	speed of radio waves
A	higher than gamma	greater than gamma
B	higher than gamma	same as gamma
C	lower than gamma	greater than gamma
D	lower than gamma	same as gamma

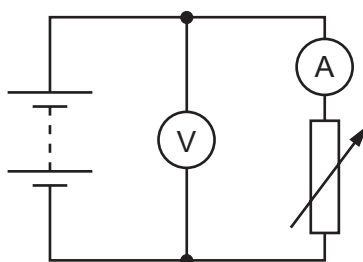
- 36** The diagram shows the scale of an analogue ammeter.



What is the reading on the ammeter?

- A** 0.22 A **B** 0.24 A **C** 0.27 A **D** 0.36 A

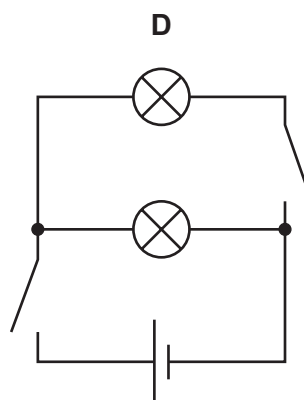
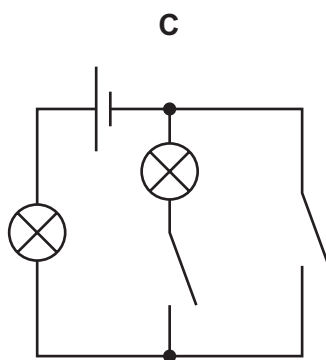
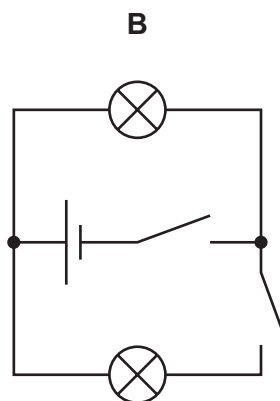
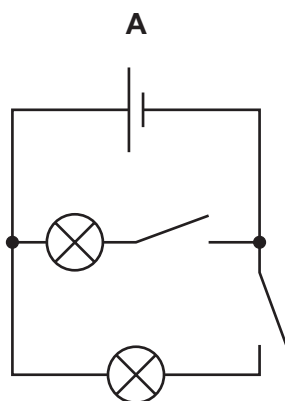
- 37 The diagram represents a circuit that includes a battery, an ammeter, a voltmeter and a variable resistor.



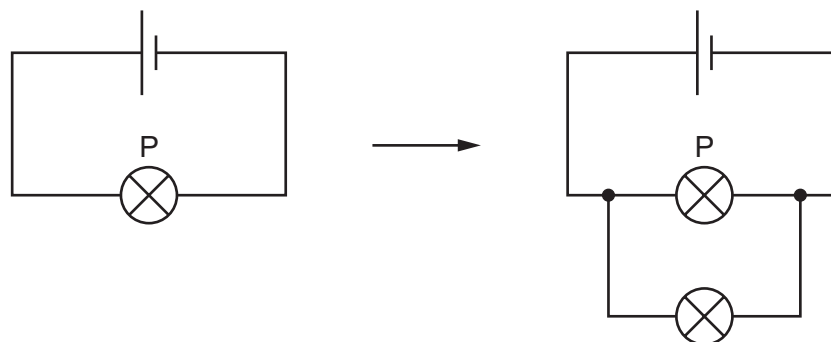
What happens to the readings on the meters as the resistance of the variable resistor is increased?

	ammeter reading	voltmeter reading
A	decreases	decreases
B	decreases	stays constant
C	increases	decreases
D	increases	stays constant

- 38 Which circuit allows each lamp to be switched on and off independently of the other lamp?



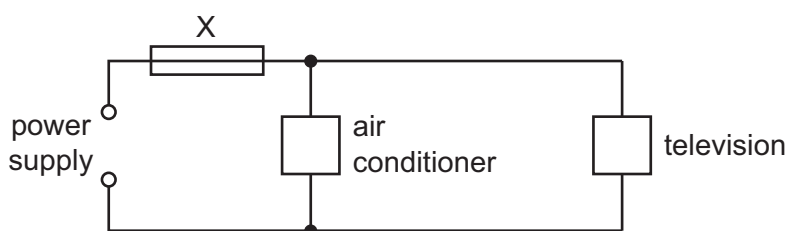
- 39 Lamp P is connected to a cell. A second lamp is then connected in parallel with lamp P.



How does this change affect the brightness of lamp P and how does it affect the current in the cell?

	brightness of lamp P	current in cell
A	less bright	greater
B	less bright	unchanged
C	unchanged	greater
D	unchanged	unchanged

- 40 An air conditioner and a television are both connected to the same electrical circuit.



The current in the air conditioner is 9.0 A and the current in the television is 2.0 A .

Several different fuses are available.

Which fuse should be connected at X?

- A** 1 A **B** 3 A **C** 7 A **D** 13 A

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The Periodic Table of Elements

Group																			
I	II											III	IV	V	VI	VII	VIII		
3 Li lithium 7	4 Be beryllium 9	Key atomic number atomic symbol name relative atomic mass										1 H hydrogen 1							2 He helium 4
11 Na sodium 23	12 Mg magnesium 24											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20		
												13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40		
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84		
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium —	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131		
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids		72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium —	85 At astatine —	86 Rn radon —		
87 Fr francium —	88 Ra radium —	89–103 actinoids		104 Rf rutherfordium —	105 Db dubnium —	106 Sg seaborgium —	108 Hs hassium —	109 Mt meitnerium —	110 Ds darmstadtium —	111 Rg roentgenium —	112 Cn copernicium —		114 Fl flerovium —		116 Lv livermorium —				

lanthanoids

actinoids

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 europium 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 dm³ at room temperature and pressure (r.t.p.).