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Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/12**

Paper 1 Multiple Choice (Core) **February/March 2019**

45 minutes

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

7957757221

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.
A copy of the Periodic Table is printed on page 16.
Electronic calculators may be used.

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1 A car enters a garage, is filled with fuel and is driven away.

Which characteristic of living organisms is **not** matched by a similar process in the car?

A excretion

B growth

C movement

D respiration

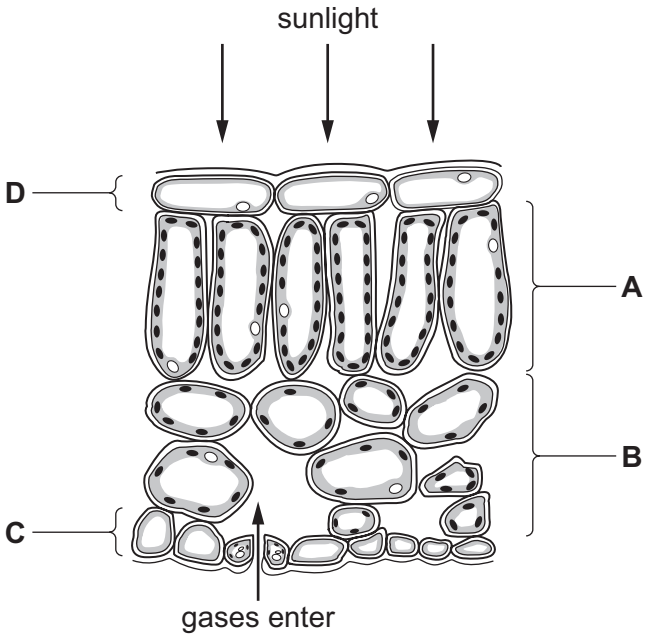
2 In an experiment, an enzyme from the human alimentary canal is found to work slowly at 20 °C.

What is the optimum temperature for enzymes working in the human alimentary canal?

A 17 °C **B** 27 °C **C** 37 °C **D** 77 °C

3 The diagram shows some cells in a leaf of a green plant.

In which layer of cells does most photosynthesis occur?



4 Vegetarians do not eat meat.

Which nutrient in meat do vegetarians need to get from other kinds of food?

A fibre

B protein

C starch

D vitamin C

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5 Which process is defined as taking substances into the body through the mouth?

A absorption

B digestion

C egestion

D ingestion

6 Digestion can be defined as the breakdown of

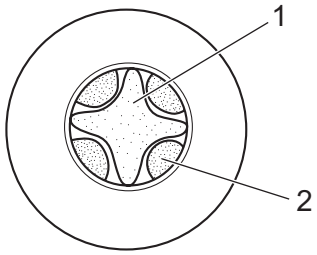
A large insoluble molecules to small soluble molecules.

B small insoluble molecules to large soluble molecules.

C large soluble molecules to small insoluble molecules.

D small soluble molecules to large insoluble molecules.

7 The diagram shows a transverse section through a plant root.



In which tissue is water transported from the root to the leaves?

A 1 and 2 **B** 1 only **C** 2 only **D** neither 1 or 2

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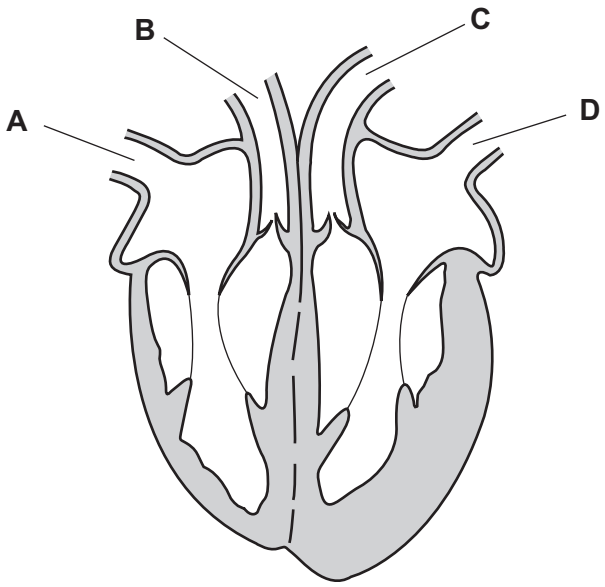
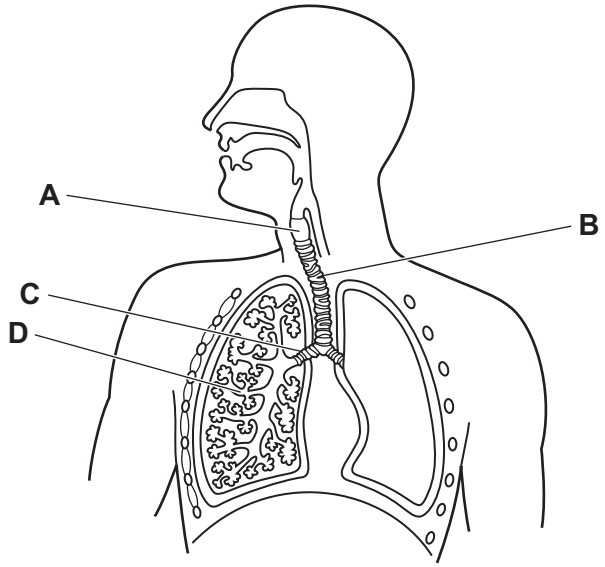
8 The diagram shows a section through the human heart.

Which vessel is a vein containing oxygenated blood?



9 The diagram shows the human gas exchange system.

Which is the larynx?



10 What are the reactants in aerobic respiration?

A carbon dioxide and oxygen

B carbon dioxide and water

C glucose and oxygen

D glucose and water

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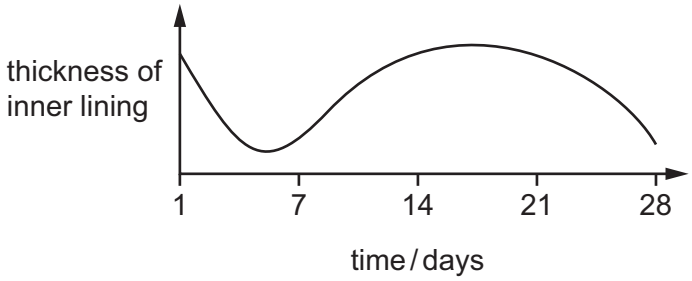
11 Which row is correct for sexual reproduction?

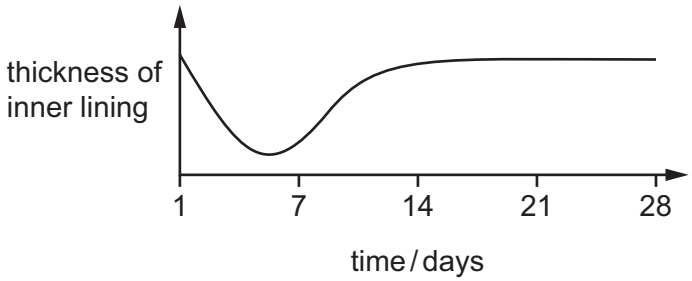
	genetically different offspring produced	one parent	zygote produced
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

12 Which diagram correctly matches the timescale of a 28-day menstrual cycle with the thickness of the inner lining of the uterus?

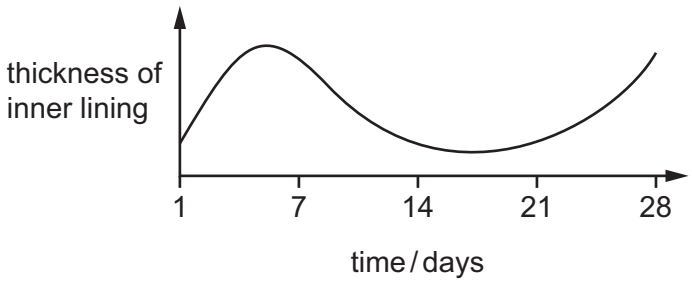
A



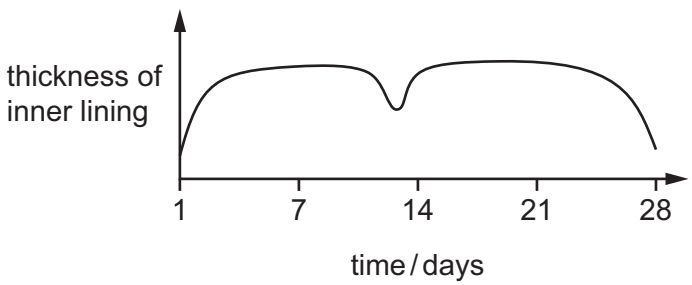
B



C



D



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13 A farmer chops down a tree to provide firewood. He gets warm when chopping down the tree. The farmer then burns the wood to keep warm.

What is the original source of the energy that warms the farmer in both cases?

A photosynthesis by the tree growing the wood

B respiration

C the match used to light the fire

D the Sun

14 Which statement describes oxygen molecules at room temperature and pressure?

A They are closely packed and move around slowly.

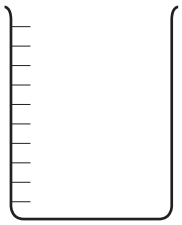
B They are closely packed and vibrate about a fixed point.

C They are loosely packed and move around rapidly.

D They are loosely packed and vibrate about a fixed point.

15 Which piece of equipment can be used to measure exactly 21.6 cm^3 of dilute sulfuric acid?

A

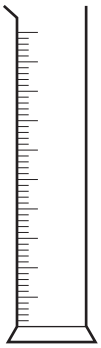


beaker

B

burette

C



measuring cylinder

D

pipette

16 Which compound contains covalent bonds?

A $CuCl_2$ **B** HCl **C** KCl **D** $MgCl_2$

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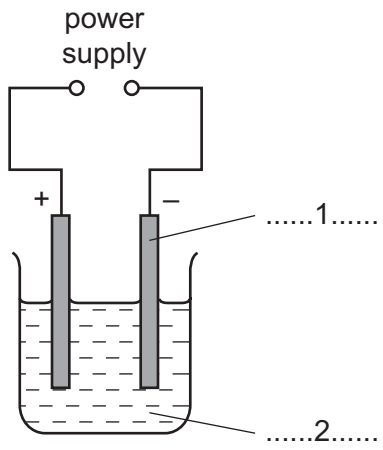
17 The diagram shows apparatus used to pass an electric current through dilute sulfuric acid.



Which row completes gaps 1 and 2?

	1	2
A	anode	electrolysis
B	anode	electrolyte
C	cathode	electrolysis
D	cathode	electrolyte

18 Four statements about reactions are listed.

1 Burning a fuel is an exothermic reaction.

2 Endothermic reactions heat up the surroundings.

3 Endothermic reactions take in energy.

4 When exothermic reactions take place the reactants gain energy.

Which statements are correct?

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

19 When magnesium is heated with steam, a white solid and hydrogen gas are formed.

What happens to the magnesium in this reaction?

A It is neutralised.

B It is oxidised.

C It is reduced.

D It is thermally decomposed.

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20 Copper nitrate is prepared by reacting excess copper oxide with dilute nitric acid.

How is a solid sample of copper nitrate obtained from the reaction mixture?

A Add an excess of dilute nitric acid.

B Distil the solution.

C Filter the solution and dry the residue in the filter paper.

D Filter the solution and crystallise the filtrate.

21 A solution is tested for the presence of cations.

test	result
add excess aqueous ammonia	green precipitate

Which cation is present?

A Cu^{2+} **B** Fe^{2+} **C** Fe^{3+} **D** Zn^{2+}

22 Which statement about elements in the Periodic Table is **not** correct?

A The elements in Group I are hard metals.

B The elements in Group I react with water to give hydrogen.

C The elements in Group VII exist as diatomic molecules.

D The elements in Group VII are non-metals.

23 Which statement describes noble gases?

A They all have eight electrons in their outer shell.

B They are monatomic gases.

C They form ions with full outer shells of electrons.

D They react with oxygen to form unreactive compounds.

24 What is brass?

A a compound formed between two metals

B a compound formed between two non-metals

C a mixture containing two metals

D a mixture containing two non-metals

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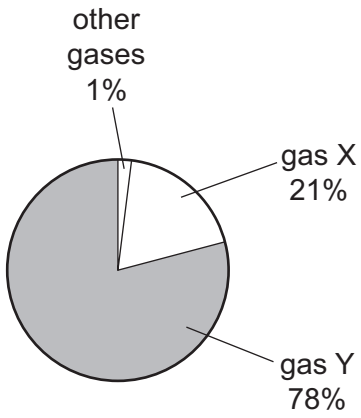
25 The diagram shows the composition of clean air.



What are X and Y?

	X	Y
A	carbon dioxide	oxygen
B	nitrogen	oxygen
C	oxygen	carbon dioxide
D	oxygen	nitrogen

26 Which of hydrogen, petroleum and wood are fossil fuels?

	hydrogen	petroleum	wood
A	✓	✓	✓
B	✓	✗	✗
C	✗	✓	✗
D	✗	✗	✓

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27 P, Q, R and S are four hydrocarbons.

P is unsaturated.

Q contains only single covalent bonds.

R undergoes addition polymerisation.

S decolourises bromine water.

Which row identifies these hydrocarbons?

	P	Q	R	S
A	alkane	alkene	alkane	alkane
B	alkene	alkane	alkane	alkene
C	alkene	alkane	alkene	alkane
D	alkene	alkane	alkene	alkene

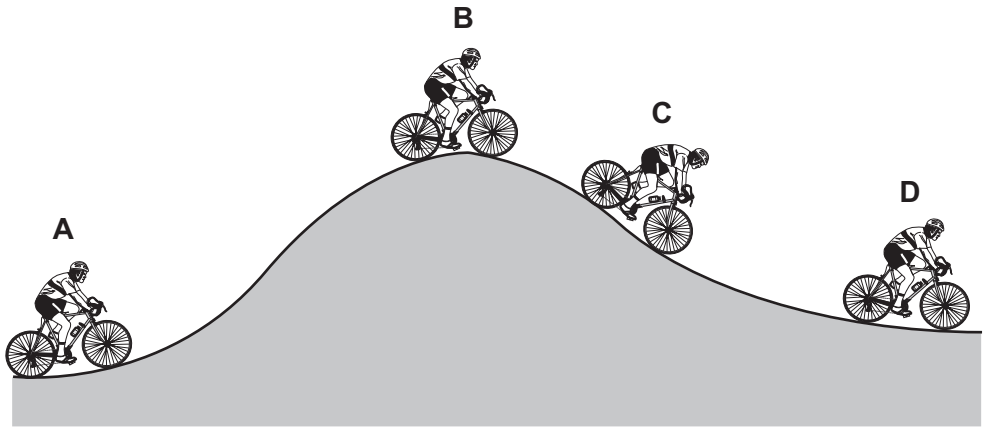
28 An object with mass 5.0 kg is dropped. The acceleration of free fall is 10 m / s^2.

What is the weight of the object?

A 0.50 N **B** 2.0 N **C** 5.0 N **D** 50 N

29 The diagram shows a cyclist riding along a hilly road.

At which position does the cyclist have the least gravitational potential energy?



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30 Which row correctly compares the separation of molecules in different states of matter?

	molecules in a solid are	molecules in a liquid are
A	closer together than in a gas	closer together than in a gas
B	closer together than in a gas	further apart than in a gas
C	further apart than in a gas	closer together than in a gas
D	further apart than in a gas	further apart than in a gas

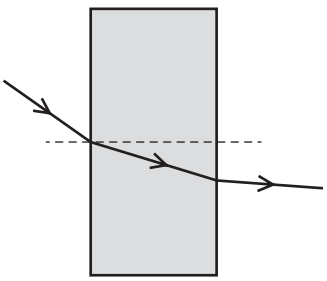
31 Which row gives thermal properties of air and aluminium?

	air	aluminium
A	a bad thermal conductor	a bad thermal conductor
B	a bad thermal conductor	a good thermal conductor
C	a good thermal conductor	a bad thermal conductor
D	a good thermal conductor	a good thermal conductor

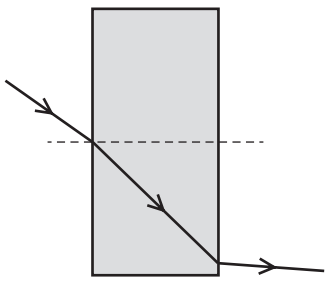
32 A ray of light in air is incident on a plastic block.

Which diagram shows the path of the light through the block?

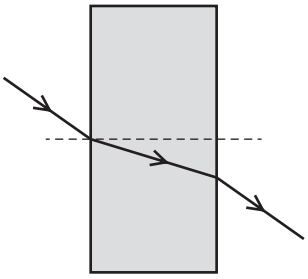
A



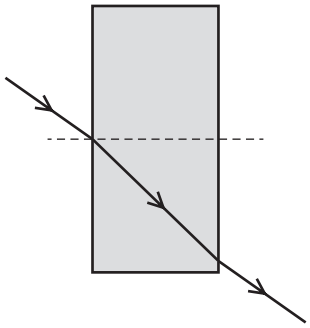
B



C



D



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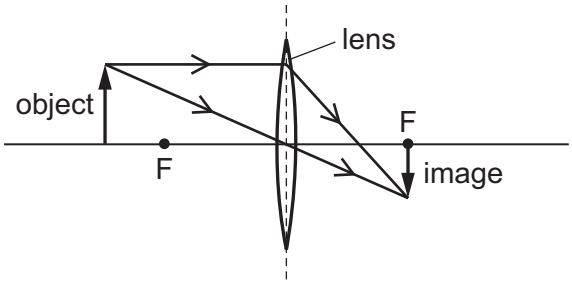
33 A thin converging lens forms a real image.

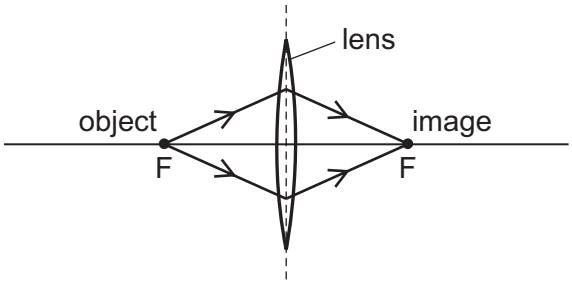
In the diagrams F indicates each principal focus of the lens.

Which diagram shows how a real image of the object is formed?

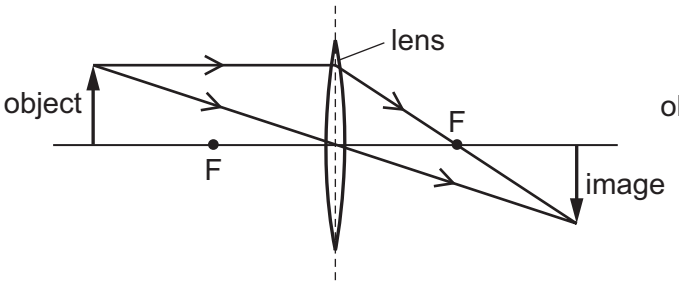
A



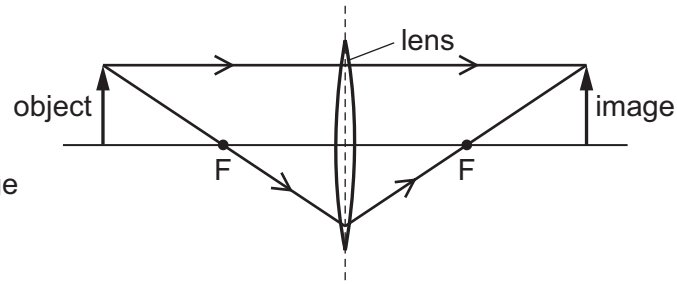
B



C



D



34 Which is **not** part of the electromagnetic spectrum?

A gamma radiation

B microwaves

C radio waves

D sound waves

35 A girl stands 187 m from a tall building and shouts. She hears the echo of the sound 1.1 s later.

Using this information, what is the speed of sound in air?

A 85 m / s **B** 170 m / s **C** 330 m / s **D** 340 m / s

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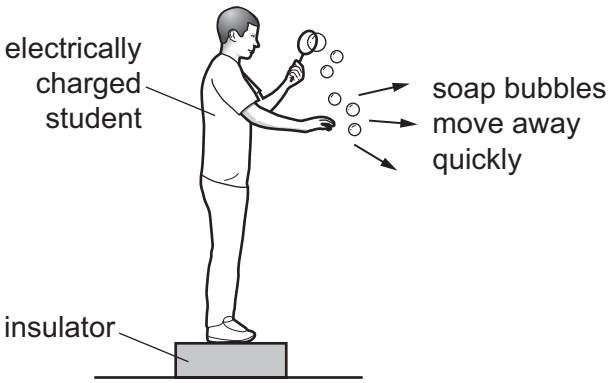
36 An electrically charged student produces soap bubbles. When he holds his hand near the bubbles, they move away quickly from his hand.



For this movement of the bubbles to happen, which statement is correct?

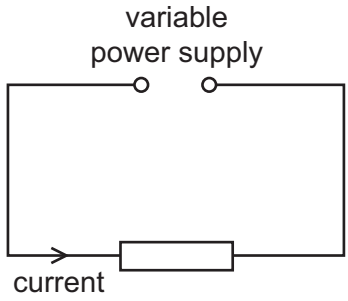
A The bubbles must be negatively charged.

B The bubbles must be positively charged.

C The bubbles must have the opposite charge to the charge on the student.

D The bubbles must have the same charge as the charge on the student.

37 A variable power supply is connected to a resistor and there is a current in the resistor.



The potential difference across the resistor is decreased.

The temperature of the resistor does not change.

What happens to the current in the resistor and what happens to the resistance of the resistor?

	current	resistance
A	decreases	increases
B	decreases	stays the same
C	increases	decreases
D	increases	stays the same

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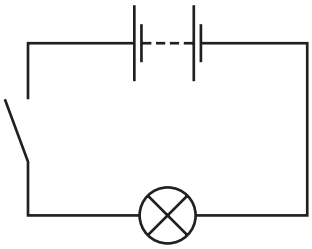
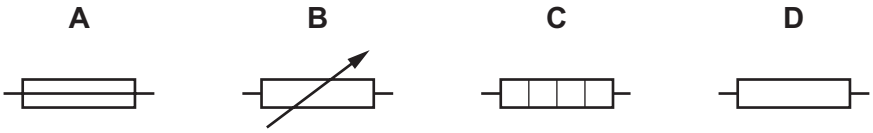
38 The diagram shows a circuit used to light a lamp in a torch.

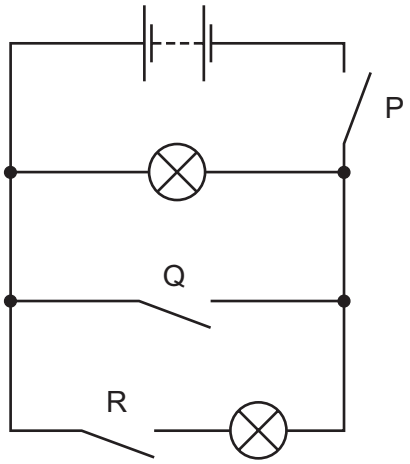


The user wants a torch in which the brightness of the lamp can be varied.

Which component is connected in series with the lamp to do this?



39 The diagram shows a circuit with three switches P, Q and R.



Which switches must be closed so that both lamps light?

A P and Q only

B P and R only

C Q and R only

D P, Q and R

40 Why are mains electrical circuits fitted with a fuse?

A to allow the cable to pass more current

B to increase the power that can be delivered by the cables

C to increase the voltage that the cables deliver

D to prevent the cables from overheating

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The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											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	75 Re rhenium 186	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 –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	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
actinoids	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.).

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