

COMBINED SCIENCE

Paper 1 Multiple Choice

0653/13 October/November 2010 45 minutes

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, highlighters, 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.

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 **20**.

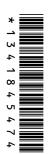
This document consists of 17 printed pages and 3 blank pages.



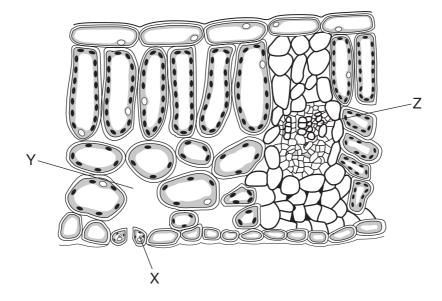
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- 1 Which part of a plant cell contains starch grains?
 - A cell wall
 - **B** chloroplasts
 - C nucleus
 - D vacuole
- 2 The diagram shows a section through a leaf.



What are X, Y and Z?

	Х	Y	Z
Α	epidermis cell	air space	phloem
в	epidermis cell	stoma	xylem
С	guard cell	air space	xylem
D	guard cell	stoma	phloem

3 When a plant cell is placed in a dilute solution of red dye, the contents of the cell do not become red.

What prevents the dye molecules from entering the cell?

- A cell surface membrane
- B chloroplasts
- C cytoplasm
- **D** vacuole

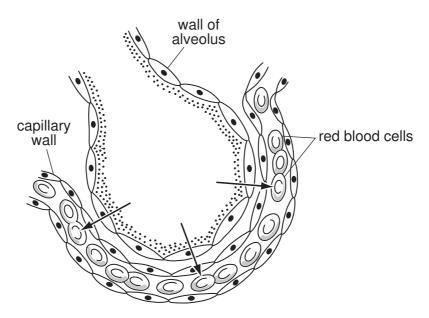
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4 Which is correct for all enzymes?

	made of proteins	made inside cells
Α	\checkmark	\checkmark
в	\checkmark	x
с	×	\checkmark
D	×	x

- 5 Which blood vessel carries oxygenated blood away from the heart?
 - A aorta
 - B pulmonary artery
 - C pulmonary vein
 - D vena cava
- 6 The diagram shows an alveolus and one of its capillaries.



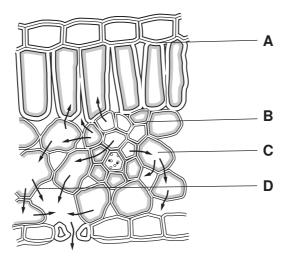
What moves in the direction shown by the arrows?

- A carbon dioxide
- B hydrogen
- C oxygen
- D water

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7 The diagram shows a section through a leaf. The arrows show water movement.

Where does the water evaporate?



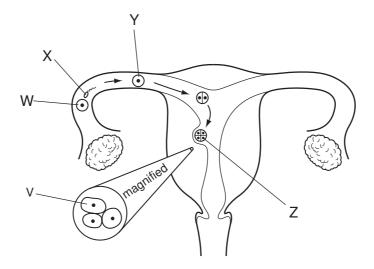
8 What is the stimulus for insulin secretion and what is the effect of insulin on the liver?

	stimulus for secretion	effect on the liver
Α	high blood glucose	decreased glucose uptake
в	high blood glucose	increased glucose uptake
С	low blood glucose	decreased glucose uptake
D	low blood glucose	increased glucose uptake

- 9 Which nutrient, when deficient in the diet, causes a lack of haemoglobin in red blood cells?
 - A calcium
 - B iron
 - **C** vitamin C
 - D vitamin D
- 10 Which variation amongst humans is not affected by diet?
 - A blood group
 - B bone strength
 - C height
 - D speed of wound healing

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11 The diagram shows the uterus and stages in the formation and implantation of a human embryo.



Which cells are genetically identical?

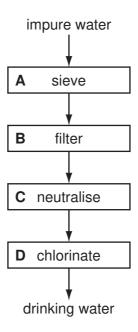
- **A** W and Z **B** X and V **C** X and Y **D** Y and Z
- **12** The table shows the names of plant reproductive structures.

Which does not link a structure with what it contains?

	structure	what it contains
Α	anther	pollen grain
в	fruit	seed
С	seed	embryo
D	style	ovule

13 The chart shows four stages in the purification of drinking water.

Which stage sterilises the water?



- 14 What will increase soil erosion?
 - A deforestation
 - B maintaining natural plant cover
 - C reducing grazing by livestock
 - D terracing of the land
- **15** Three students make statements about the differences between elements, compounds and mixtures.
 - Student 1 All elements exist only as atoms and not molecules.
 - Student 2 Compounds contain at least two elements.

Student 3 Mixtures consist only of compounds.

Which students are correct?

- **A** 1 only **B** 2 only **C** 3 only **D** 1, 2 and 3
- 16 Which three elements are all transition elements?
 - A chlorine, bromine and iodine
 - B helium, neon and argon
 - C iron, cobalt and nickel
 - **D** lithium, sodium and potassium

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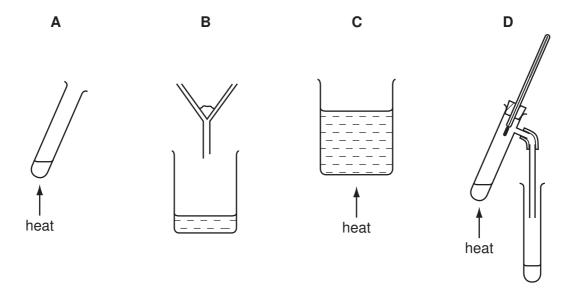
17 The table shows information about four different compounds.

	formula of compound	elements present in compound
Α	CO ₂	carbon, oxygen
В	HC1	hydrogen, chlorine
С	NH_3	nitrogen, hydrogen
D	Na ₂ O	sodium, oxygen

Which compound contains ionic bonds?

18 Aqueous copper(II) sulfate consists of copper(II) sulfate dissolved in water.

Which apparatus could not be used to remove water from this solution?



19 Aluminium occurs as aluminium oxide in the ore bauxite.

Which terms apply to the extraction of aluminium from aluminium oxide?

	electrolysis	reduction
Α	\checkmark	1
в	\checkmark	x
С	x	\checkmark
D	X	x

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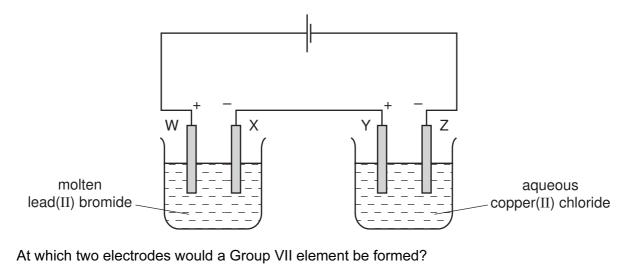
20 The equation represents the reaction of aluminium with sulfuric acid.

$$x Al + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + yH_2$$

What are the correct values of *x* and *y*?

	x	У
Α	2	3
в	2	6
С	3	3
D	3	6

21 An electrolysis circuit is set up using carbon electrodes as shown.

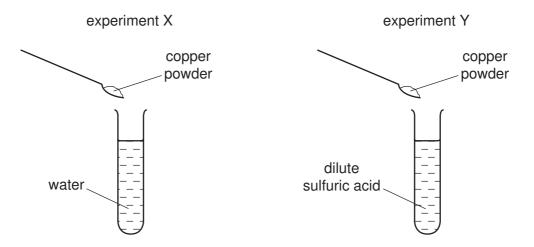


A W and Y B W and Z C X and Y D X and Z

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22 Aqueous copper(II) ions, Cu²⁺(aq), are blue.

In separate experiments, X and Y, copper powder is added to a test-tube of liquid and the mixture stirred. At the end of each experiment some copper powder remains at the bottom of each tube.

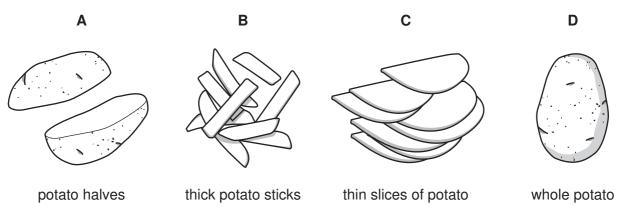


What are the final colours of the liquids above the copper powder?

	experiment X	experiment Y
Α	blue	blue
в	blue	colourless
С	colourless	blue
D	colourless	colourless

23 A 250 g portion of potatoes is to be cooked in boiling water.

Which form of the potatoes will require the shortest cooking time?



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- 24 The equations for two reactions are shown.
 - X $PbCO_3 \rightarrow PbO + CO_2$
 - $Y \quad CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

Which types of reaction are X and Y?

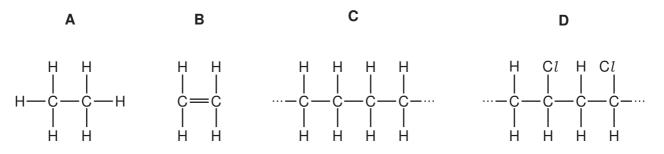
	Х	Y
Α	combustion	neutralisation
в	combustion	thermal decomposition
С	thermal decomposition	combustion
D	thermal decomposition	neutralisation

25 Two products, X and Y, are formed in the complete combustion of methane.

What are X and Y?

- A carbon and hydrogen
- B carbon and water
- C carbon dioxide and hydrogen
- D carbon dioxide and water

26 Which structure shows a polymer that is also a hydrocarbon?

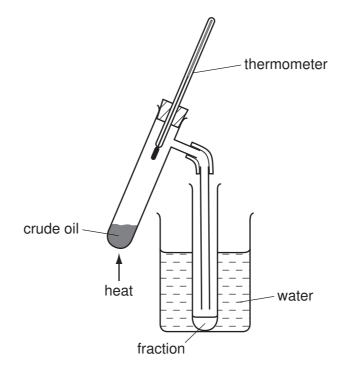


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27 Crude oil (petroleum) is heated, using the apparatus shown.

Four fractions, with different boiling point ranges, are collected.

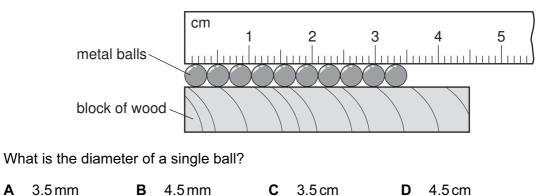


Which term best describes crude oil?

- **A** a compound
- B an element
- **c** a mixture
- D a plastic
- 28 Which statement is correct?
 - A The mass of a bottle of water at the North Pole is different from its mass at the Equator.
 - **B** The mass of a bottle of water is measured in newtons.
 - **C** The weight of a bottle of water and its mass are both measured in kilograms.
 - **D** The weight of a bottle of water is one of the forces acting on the bottle.

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29 A ruler and a block of wood are used to find the diameter of some identical metal balls.

30 Which substance in the table has the lowest density?

	substance	mass/g	volume/cm ³
Α	nylon	1.2	1.0
в	cotton	1.5	1.0
С	olive oil	1.8	2.0
D	water	2.0	2.0

31 In a hydroelectric power station, one form of energy is stored in a reservoir. This energy is then transferred in stages to another form, which is the output.

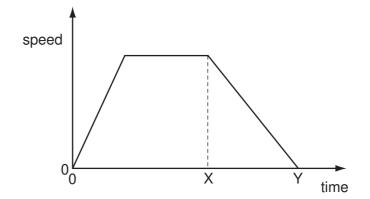
Which row gives the names for the stored energy and the output energy?

	stored energy	output energy
Α	electrical	heat
в	electrical	kinetic
С	kinetic	electrical
D	potential	electrical

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32 The graph shows how the speed of an object changes over an interval of time.



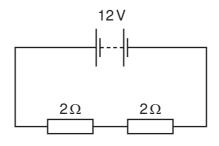
Which statement describes the acceleration of the object between time X and time Y?

- A It is constant.
- B It is decreasing.
- C It is increasing.
- D It is zero.
- **33** A camper sits beside a fire and quickly begins to feel warm. He pushes the end of a metal rod into the fire and after a while his hand feels the rod getting warm.

Which heat transfers are taking place?

	heat transfer from fire through the air	heat transfer from fire through the rod
Α	conduction	convection
в	conduction	radiation
С	radiation	conduction
D	radiation	convection

34 The diagram shows an electrical circuit.



What is the current through the circuit?

	Α	3A	В	4A	С	12A	D	24 A
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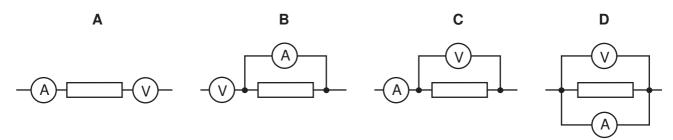
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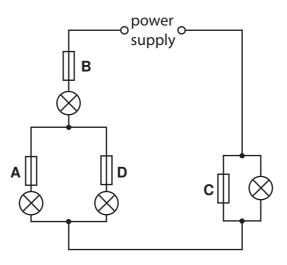
35 The diagrams show part of an electric circuit containing an ammeter and a voltmeter.

Which arrangement should be used to measure the potential difference (p.d.) across the resistor and the current through it?



36 In the circuit shown, only one of the fuses has blown, but none of the lamps is lit.

Which fuse has blown?



37 A police car with its siren sounding is stationary in heavy traffic. A pedestrian notices that, although the loudness of the sound produced does not change, the pitch varies.

Which row in the table describes the amplitude and the frequency of the sound?

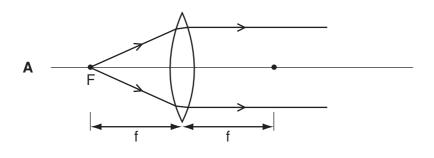
	amplitude	frequency
Α	constant	constant
в	constant	varying
С	varying	constant
D	varying	varying

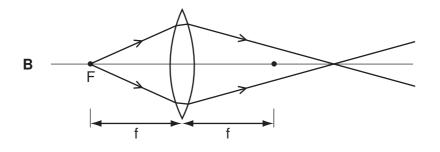
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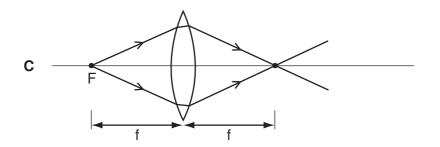
38 The Sun heats the Earth by electromagnetic radiation.

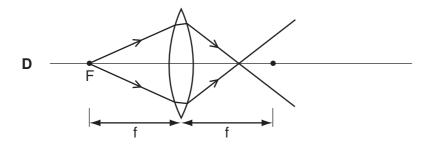
Which region of the electromagnetic spectrum is responsible for most of this heating?

- A microwave
- B infra-red
- C ultraviolet
- D X-ray
- 39 A source of light is placed at the focus F of a converging lens. The focal length of the lens is f.Which diagram shows the path of the rays of light that pass through the lens?









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	electric charge	penetrates 1 cm of aluminium?
Α	negative	yes
в	negative	no
С	positive	yes
D	positive	no

40 Which row in the table describes alpha-particles?

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	0	4 Helium 2	10 Neon Neon A	Argon 18	84	Krypton 36	131	Xenon	54	Rn	B6 86		175 Lu Lutetium	5	Lawrencium 103
	١١٨		9 35.5 35.5	Chlorine	80	Bromine 35	127	_	53	At	Astatine 85		173 Yb Ytterbium	No	102
	N		A 32 Oxygen O 16		62	Selenium 34	128		79	Ро	Polonium 84		169 Tm Thulium	PW	Mendelevium 101
	>		14 7 Nitrogen 31	Phosphorus 15	75	AS Arsenic 33	122	Sb	10	Bi	Bismuth 83		167 Er Erbium	E E	100
	2		5 58 Cathon C 12	Silicon	73	Ge Germanium 32	119		DG	Pb	82 B2		165 Holmium	E	Einsteinium 99
			5 Boron 11 27 27	Aluminium 13	70	Ga Gallium 31	115	Indium Indium	49	71	Thallium 81		162 Dysprosium	Ċ	Californium 98
					65	Zn ^{Zinc}	112	Cadmium	48	Hg	Mercury 80		159 Tb Terbium	ä	berkelium 97
					64	Copper 29	108	Ag Silver	4/	Au	Gold 79		157 Gd Gadolinium	E C	Currum 96
Group					59	28 Nickel	106	Palladium	4 6	£	Platinum 78		152 Europium 63	Am	Americium 95
Gro			_		59	Cobalt Cobalt 27	103	Rhodium	45	Ir	Iridium 77		150 Samarium 62		Plutonium 94
		Hydrogen			56	Fe Iron 26	101	Ruthenium	44	0s	Osmium 76		Promethium 61	dN	Neptunium 93
					55	Manganese 25		Technetium	43	Be Be	Rhenium 75		144 Neodymium	C 238	Uranium 92
					52	Chromium 24	96	Molybdenum	42	₫ 8	Tungsten 74		141 Pr Praseodymium 59	Pa	Protactinium 91
					51	Vanadium 23	93	Niobium M	41	∎ ∎	Tantalum 73		140 Cerium 58	H ²³²	I horium 90
					48	Titanium 22	91	Zirconium	40	°≓ H	Hafnium 72			nic mass bol	nic) number
			· · · · · ·		45	Scandium 21	89	~	38	La	Lanthanum 57 *	227 Actinium 89	l series eries	a = relative atomic mass X = atomic symbol	b = proton (atomic) number
	=		9 Beryllium 24	Magnesium 12	40	Calcium 20	88	Strontium	38	Ba	Barium 56	226 Rad 88	*58-71 Lanthanoid series 190-103 Actinoid series	a X	q
			Lithium 23	Sodium	39	Potassium 19	85	Rubidium Rubidium	0	S S	Caesium	Francium	71 L 103		q

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