

Candidates answer on the Question Paper.

No Additional Materials are required.

## **READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in. Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs, tables or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

A copy of the Periodic Table is printed on page 20.

At the end of the examination, fasten all your work securely together. The number of marks is given in brackets [ ] at the end of each question or part question.

For Exam	iner's Use
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

This document consists of 18 printed pages and 2 blank pages.



(a) Complete Table 1.1 by choosing one of the words from the list to match 1 statement.

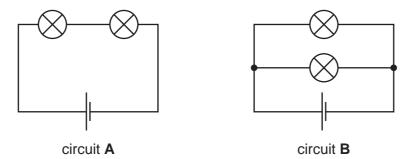
Table 1.1 by	choosing one	2 of the words from		M. Papac
	choosing one			For For
ammeter	ampere	electron	insulator	atch Scann For iner's
annietei	ampere	election	insulator	.C.
ohm	volt	voltmeter	watt	OTH
	<b>-</b>			

## Table 1.1

statement	word
a particle with a negative electrical charge	
an instrument that measures electrical current	
the unit of potential difference	
a material that does not conduct electricity	

[4]

(b) Fig. 1.1 shows two circuits, **A** and **B**. All the lamps and both cells are the same.





(i) One lamp is unscrewed from circuit A.

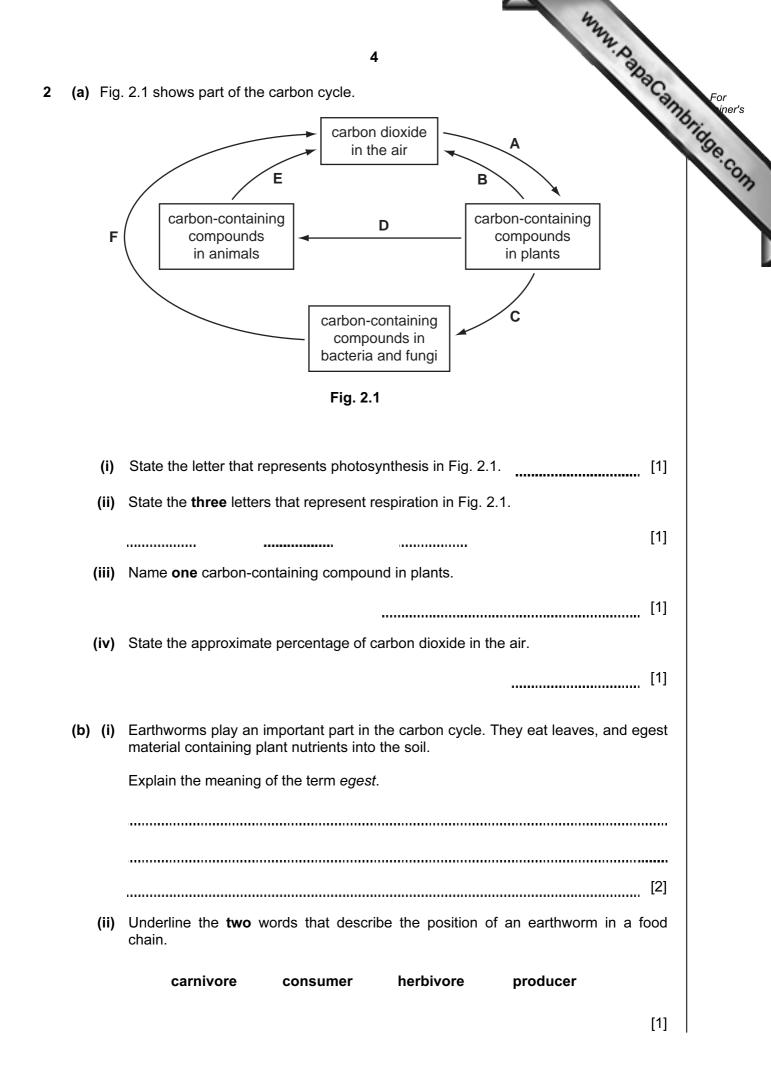
State what happens to the other lamp.

Explain your answer.

..... ..... [2]

	442
	3
(ii)	3 Explain why lights in a house are connected as in circuit <b>B</b> and <b>not</b> as in circuit
	[2]
(iii)	The resistance of each lamp is $1.2 \Omega$ .
	Calculate the combined resistance of the two lamps in circuit <b>A</b> .
	State the formula that you use and show your working.
	formula used
	working

.....Ω [2]



	532 State	
	5	
(iii)	Fishermen catch large numbers of earthworms to use as bait.	For
	There are concerns that too many earthworms are being collected.	nonic, mers
	Suggest why it is important to conserve earthworms.	Sec.
		]
		[2]

3 (a) Fig. 3.1 shows how a digital pH meter is used to measure the pH of some liquids

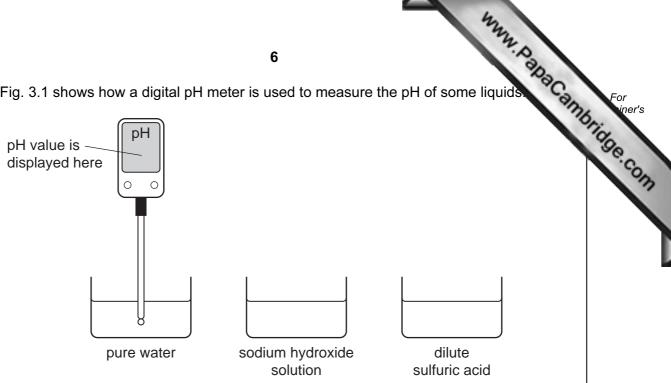


Fig. 3.1

(i) Complete Table 3.1 by suggesting suitable pH values for the different liquids.

Table	3.	1
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liquid	рН
pure water	
sodium hydroxide solution	
dilute sulfuric acid	

[3]

(ii) Suggest one advantage of using a digital pH meter rather than a piece of litmus paper to compare the acidity of two different acid solutions.

......[1]

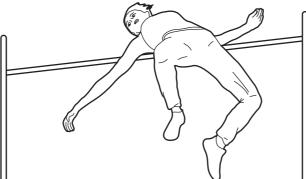
(b) Describe how a student could use a solution of acidified silver nitrate to find out whether or not an unlabelled solution contains sodium chloride.

..... [2] 

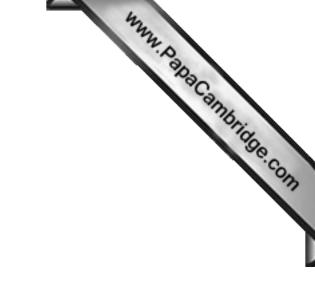
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www.papaCambridge.com 7 (c) When a reactive metal is added to a dilute acid, the metal reacts and dissolves gas is given off. (i) Name one reactive metal that must not be added to a dilute acid. Explain why this metal should not be added to acid. metal explanation [2] (ii) Fig. 3.2 shows how a student tested the gas given off when magnesium was added to dilute hydrochloric acid. burning splint ° ° dilute 0 0 hydrochloric С magnesium acid Fig. 3.2 State and explain what the student observed when he carried out this test. observation explanation [2]

- www.papacambridge.com (a) Describe the energy changes that take place between the athlete taking off and landing after the high jump. ..... [3] (b) After jumping, the athlete is sweating. (i) Describe, in terms of particles, how evaporation occurs from the surface of a liquid. ..... (ii) Explain how this process will cool down the athlete. ..... [1]
- An athlete competes in the high jump. 4



8

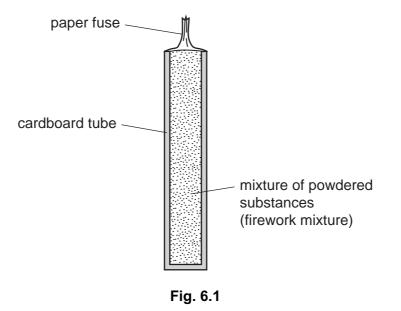


Please turn over for Question 5.

le 5.'	1 shows some	of the nutrients	contained in 10	0g of five foods		19
			Table 5.1			W. PapaCa.
			nutr	ients		
	food	sugar/g	starch/g	protein/g	fat/g	
	Α	0	0	13	10	
	В	14	6	7	0	
	С	0	0	14	6	
	D	6	8	12	14	
	E	9	14	3	0	
	Which nutrient		5.1 contains nit	arbohydrates? rogen atoms in i at could have cor	ts molecules	[1]
i)	Which nutrient	t listed in Table	5.1 contains nit	rogen atoms in i	ts molecules	? [1]
)	Which nutrient	t listed in Table rs of <b>two</b> foods and	and 5.1 contains nit  in Table 5.1 tha	rogen atoms in i	ts molecules	? [1] nals. [1]
	Which nutrient State the letter State the letter	t listed in Table rs of <b>two</b> foods and er of <b>one</b> food	and 5.1 contains nit  in Table 5.1 tha that would ap	rogen atoms in i	ts molecules ne from anim wn when te	? [1] nals. [1]
i) i) ⁄)	Which nutrient State the letter State the letter iodine solution	t listed in Table rs of <b>two</b> foods and er of <b>one</b> food a, and give a pur	and 5.1 contains nit in Table 5.1 tha that would ap rple colour whe	rogen atoms in i at could have cor pear orange-bro n tested with biu	ts molecules ne from anin wn when te ret reagent.	? [1] nals. [1] ested with
i) i) ⁄)	Which nutrient State the letter State the letter iodine solution	t listed in Table rs of <b>two</b> foods and er of <b>one</b> food a, and give a pur	and 5.1 contains nit in Table 5.1 tha that would ap rple colour whe	rogen atoms in i at could have cor pear orange-bro n tested with biu	ts molecules ne from anin wn when te ret reagent.	(1] nals. [1] ested with
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) ) abl	Which nutrient State the letter State the letter iodine solution State the letter le 5.1 does <b>no</b> ine the sympto	t listed in Table rs of <b>two</b> foods and er of <b>one</b> food a, and give a pur r of the food tha <b>t</b> contain informa	and 5.1 contains nit in Table 5.1 tha that would ap rple colour whe t provides the r ation about vita	rogen atoms in i at could have cor pear orange-bro n tested with biu most energy per	ts molecules ne from anin wm when te ret reagent. 100 g. 5. ficient in	(1] nals. (1] ested with (1]

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(c)	Explain why eating a lot of foods containing sugar can increase the risk of tooth	For iner's
		ase con
	[3]	

- www.papaCambridge.com Some types of firework are made by filling a cardboard tube with firework mixture. A mixture is made from several solid substances which have been powdered and m 6 together.
  - Fig. 6.1 shows a typical firework.



When the paper fuse is lit, exothermic chemical reactions occur inside the firework.

(a) (i) State two forms of energy that are released when the firework mixture reacts. 1 \_\_\_\_\_ [2] 2 (ii) State the effect on the rate of reaction of using firework mixture in the form of a powder. [1] .....

(b) Some firework mixtures contain aluminium which is oxidised when the firework

www.papaCambridge.com Table 6.1 shows the numbers of protons and electrons in four particles, A, B, C and which are involved in the oxidation of aluminium.

particle	number of protons	number of electrons
Α	8	10
В	13	13
С	8	8
D	13	10

## Table 6.1

(i) Atoms of the element aluminium have the proton number 13.

State and explain which particle, **B** or **D**, in Table 6.1 is an **atom** of aluminium.

particle explanation .....[1] (ii) State and explain which two particles in Table 6.1 could be found bonded together in aluminium oxide. particles and explanation [3] (c) Firework mixtures contain the compound potassium perchlorate, KClO<sub>4</sub>. When potassium perchlorate is heated, a colourless gas is given off which re-lights a glowing splint. State the name of this gas. (i) [1] (ii) Suggest how potassium perchlorate in the firework mixture helps the mixture to burn. [2]

7 (a) On the grid below, draw a wave with an amplitude of 2 cm and a wavelength of 4 On your diagram, clearly label the amplitude and the wavelength.

14 On the grid below, draw a wave with an amplitude of 2 cm and a wavelength of 4 On your diagram, clearly label the amplitude and the wavelength.	
On the grid below, draw a wave with an amplitude of 2 cm and a wavelength of 4	For
On your diagram, clearly label the amplitude and the wavelength.	iner's
	·02
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[3]

(b) (i) Two sound waves, A and B, have the same frequency. A has a greater amplitude than B. What difference would you hear?

[1]

(ii) Two sound waves, X and Y, have the same amplitude. X has a greater frequency than Y.

What difference would you hear?

[1] .....

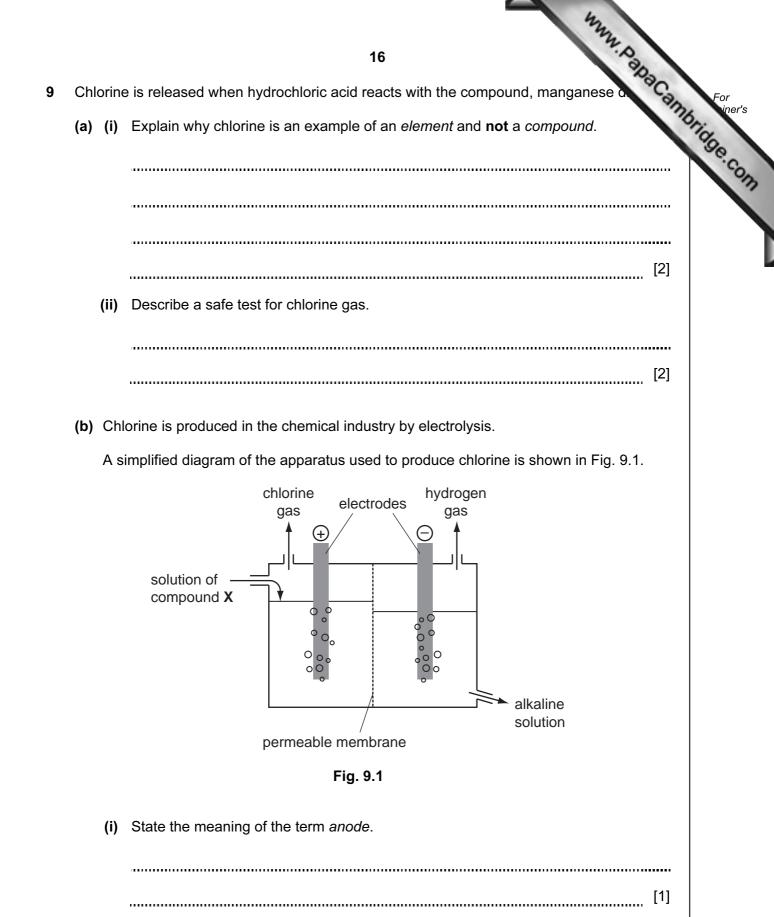
(c) Energy travels to the Earth from the Sun.

State whether this transfer of energy is by conduction, convection or radiation.

Explain your answer.

..... ..... [2]

www.papaCambridge.com 15 Fig. 8.1 shows the male reproductive system. 8 В С D Fig. 8.1 (a) (i) Name parts C and D. C [2] D \_\_\_\_\_ (ii) State the functions of parts A and B. Α B [2] (iii) On Fig. 8.1, use a label line and the letter S to indicate where male gametes are made. [1] (b) The human immunodeficiency virus (HIV) can be transmitted during sexual intercourse. Outline two other ways in which HIV can be transmitted. 1 \_\_\_\_\_ 2 [2]



	42	
	17 <sup>2,</sup> D	
(ii)	A student knows that compound <b>X</b> in Fig. 9.1 is either sodium hydroxide, Na sodium chloride, NaC <i>I</i> .	ame
	Using information from Fig. 9.1, deduce whether compound <b>X</b> is sodium hydroxid or sodium chloride.	le
	Explain your answer.	
	<b>X</b> is	
	explanation	
	[	1]
		in
(i)	Chlorine is a gas at room temperature.	
	What are the physical states of bromine and iodine at room temperature?	
	bromine	
	iodine [2	2]
(ii)	Explain briefly why a solution of sodium bromide turns orange when chlorine bubbled through it.	is
		2]
	Chl Gro (i)	<ul> <li>(ii) A student knows that compound X in Fig. 9.1 is either sodium hydroxide, Na Sodium chloride, NaCl.</li> <li>Using information from Fig. 9.1, deduce whether compound X is sodium hydroxid or sodium chloride.</li> <li>Explain your answer.</li> <li>X is</li></ul>



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	-	-			horium	tactinium	ranium	Neptunium 93	Plutonium 94	Americium 95	Curium 96	Berkelium 97	Californium 98	Einsteinium 99	Fermium 100	Mendelevium 101	Nobelium 102	Lawrencium 103	

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