

Applied Science (Double Award)

General Certificate of Secondary Education

Unit **B482/01** Science for the needs of Society

Mark Scheme for January 2011

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Question			Expected Answers	Marks	Additional Guidance
1	a	i	(high) flexibility	1	list principle if another property mentioned
		ii	reference to melting point / melts / reference to 80°C	1	list principle if another property mentioned accept 'high melting point'
		iii	any two from: not biodegradable; explains biodegradable, eg, does not rot / causes litter / animals swallow it or suffocate idea / animals get caught in it idea; flammable / gives off toxic gases (when burnt)	2	IGNORE not able to be recycled IGNORE harms animals (insufficient)
	b	i	any two from: contain carbon / C <u>atoms</u> / the <u>element</u> C; contain hydrogen / H <u>atoms</u> / the <u>element</u> H; long chain molecules / polymers; covalent	2	IGNORE 'contains C' alone and 'contains H' alone (insufficient)
		ii	PVC contains chlorine / Cl <u>atoms</u> / the <u>element</u> Cl / contains less hydrogen / contains 3 elements (rather than 2);	1	IGNORE 'contains Cl' alone (insufficient) accept 'chloride'
	c	i	polymer A	1	
		ii	any two from: more stretchy (than polymer A); quotes figures 5.0 <u>and</u> 0.5 / calculates difference (4.5); about the same strength as PVC; almost as stretchy as PVC;	2	IGNORE flexibility
Total				[10]	

Question		Expected Answers	Marks	Additional Guidance
2	a	idea of other people; breathing in smoke;	2	
	b	37 °C	1	
	c	heart diaphragm trachea rib lung	3	4/5 correct = 3 marks 2/3 correct = 2 marks 1 correct = 1 mark
	d	i oxygen; glucose	2	
		ii heart/blood; pumps or flows faster/ stronger/more;	2	IGNORE breathing rate IGNORE transports substances faster
Total			[10]	

Question			Expected Answers	Marks	Additional Guidance
3	a	i	kinetic/movement electrical	2	ACCEPT wave for the input label ACCEPT electricity/electric for the output label
		ii	7500 + 750 (1) 8250 (1)	2	correct numerical answer gains 2 marks
	b		any two from: easy to transmit/travels through wires/National Grid; clean/no waste in the home (eg no ash)/no harmful gases in the home; can be used for different appliances or devices/two examples (eg heat & light or fridge & cooker etc); easy to switch on and off / instantaneous idea / do not need to store it / constant supply;	2	IGNORE can be used for 'everything'/lots of 'things'/different 'things' (insufficient) IGNORE never runs out / references that imply renewable
	c	i	2 nd row	1	
		ii	any two from: wind; hydroelectric; geothermal; solar/sun/light; biomass/biofuel/wood; tidal	2	IGNORE wave
			Total	[9]	

Question		Expected Answers	Marks	Additional Guidance															
4	a	any two from: less carbon dioxide; more nitrogen; more oxygen/oxygen now present; less other gases	2																
	b	20 + 35 shown in working; 45%	2	45% gets 2 marks															
	c	carbon dioxide oxygen other gases nitrogen	2	all correct = 2 marks 2/3 correct = 1 mark 0/1 correct = 0 marks															
	d	i no oxygen / not enough oxygen	1																
		ii any two from: <u>less</u> oxygen (in exhaled air); <u>more</u> carbon dioxide (in exhaled air); <u>more</u> water vapour (in exhaled air); warmer (in exhaled air)	2	do not allow No oxygen do not allow 'We breathe in oxygen and breathe out Carbon dioxide'															
	e	<table border="1"> <thead> <tr> <th></th> <th>happen over millions of years</th> <th>happen quickly</th> </tr> </thead> <tbody> <tr> <td>earthquakes</td> <td></td> <td>✓</td> </tr> <tr> <td>formation of continents</td> <td>✓</td> <td></td> </tr> <tr> <td>formation of mountains</td> <td>✓</td> <td></td> </tr> <tr> <td>tsunamis</td> <td></td> <td>✓</td> </tr> </tbody> </table>		happen over millions of years	happen quickly	earthquakes		✓	formation of continents	✓		formation of mountains	✓		tsunamis		✓	2	all correct = 2 marks 2/3 correct = 1 mark
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Total			[11]																

Question		Expected Answers	Marks	Additional Guidance															
5	a	any two from: use less electricity/power / more energy efficient; less fossil fuels burnt; fossil fuels produce CO ₂ when burnt	2	IGNORE use less energy / energy wasted / less heat given out / less CO ₂ in the atmosphere															
	b	i neutrons	1																
		ii 80	1																
	c	<table border="1"> <thead> <tr> <th></th> <th>true</th> <th>false</th> </tr> </thead> <tbody> <tr> <td>three of the chemicals are compounds</td> <td></td> <td>✓</td> </tr> <tr> <td>mercury is a non-metal</td> <td></td> <td>✓</td> </tr> <tr> <td>sulphur atoms react with oxygen atoms</td> <td>✓</td> <td></td> </tr> <tr> <td>all the chemicals are inorganic</td> <td>✓</td> <td></td> </tr> </tbody> </table>		true	false	three of the chemicals are compounds		✓	mercury is a non-metal		✓	sulphur atoms react with oxygen atoms	✓		all the chemicals are inorganic	✓		2	all 4 correct = 2 marks 2/3 correct = 1 mark 1 correct = 0 marks
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	d	any two from: idea of remove mercury / remove toxic gases; treating/filtering/decontaminating/purifying/scrubbing gases or water; prevent mine water from entering rivers/water supplies/land; idea of decontaminating poisoned land; provide bottled water / alternative water supply;	2	IGNORE stopping/reducing water or gases leaving the mine – this is insufficient															
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Question			Expected Answers	Marks	Additional Guidance
6	a	i	moving/changing genes/DNA; idea of from one organism to another organism;	2	IGNORE chromosomes / part of a gene Accept cell/nucleus plant/animal / monkey to monkey
		ii	involves genes / alleles / chromosomes / DNA; genetic disease is inherited / passed on /passed down / through the family (from parents) OR infectious disease can be caught / caused by micro-organisms;	2	IGNORE born with / cannot get better
	b	i	<i>for</i> – idea enriches life eg improves quality of life, better choice of fashion / needed for a career or hobby / safety argument <i>against</i> – playing God / unnatural / reduces diversity / may cause new problems/side effects / only tested on monkeys / may not work in humans	1 1	IGNORE can see / see better / see colour / happier / nicer IGNORE it can go wrong / make you go blind
		ii	1 st row – cystic fibrosis 4 th row – Huntington's chorea	2	
	c		A genes / alleles / DNA B sexual / sex	2	DO NOT ACCEPT genetic
			Total	[10]	
			Paper Total	[60]	

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