

GCSE 2005
January Series



Mark Scheme

GCSE Applied Science (Double Award)

(3860/2F)

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Dr Michael Cresswell Director General

question	answers	extra information	marks
1(a)	yeast	ignore double headed arrows two arrows given, swap answers	1
	yeast		1
	bacteria		1
	fungus		1
(b)	alcohol	list principle applies	1
	carbon dioxide		1
(c)(i)	warmth	allow reference to shelter ignore sunlight / irrigation	1
(ii)	<u>more</u> CO ₂	accept in either position accept 0.5% CO ₂	1
	(more) photosynthesis or alternative eg make more sugar	do not accept growing faster	1
Total			9

question	answers	extra information	marks
2(a)(i)	nucleus		1
	electron		1
	proton		1
(ii)	protons	any order	1
	electrons	accept equal number of positive and negative charges = 2 marks	1
(b)(i)	Al	symbol must be correct	1
	Fe		1
	S		1
(ii)	oxygen	element must be from table	1
	aluminium		1
	sulphur	accept symbols (ecf)	1
Total			11

question	answers	extra information	marks
3(a)	any two from: <ul style="list-style-type: none"> • coal • oil / petrol / diesel etc • (natural) gas 		2
(b)(i)	carbon dioxide / CO ₂	accept other gases responsible for global warming <i>eg</i> cfc's / carbon monoxide / methane / nitrogen oxides	1
(ii)	melting of polar ice caps / rise in ocean level / change ocean currents / forest fires	do not accept warming up / vague answers accept climate change / weather change references to plants or animals must be linked to climate change	1
(c)	air		1
	heat		1
	steam		1
	turbine		1
	generator		1
Total			9

question	answers	extra information	marks
4(a)(i)	1.5		1
(ii)	under the arm / mouth / rectum		1
(b)(i)	plotting the points	$\pm 1/2$ square all correct 2 marks 4 correct 1 mark	2
	joining the points / curve of best fit 'independent mark'	do not allow zig zag	1
(ii)	6(°C)	consequential from their graph	1
(iii)	any two from: <ul style="list-style-type: none"> • material is wet • water evaporates from material • heat / energy is used to evaporate the water • poor insulation 	or any two from: <ul style="list-style-type: none"> • flask A dry material • traps air / insulator • less heat (energy) loss 	2
(iv)	any two from: <ul style="list-style-type: none"> • clothing • warm food / drink • keep dry / find shelter / change clothes • chemical heater • blanket 	ignore keep moving / exercise wear waterproof clothing = 2 marks	2
(v)	old people / babies / climbers / divers / fishermen / swimmer	accept any outdoor job or sport	1
(c)	sweating / shivering / vasodilation / hair erection		1
Total			12

question	answers	extra information	marks
5(a)	bicycle = steel / iron / aluminium / carbon / titanium / graphite	ignore metal	1
	wiring = copper or plastic / pvc / polymer / rubber	ignore metal	1
	saucepan = polymer / bakelite / plastic / wood / rubber	ignore metal	1
(b)(i)(ii) (iii)	<p>Rules:</p> <ul style="list-style-type: none"> • table blank can't score any marks in remainder of question • only give marks if chosen material is suitable (can allow metal here) • to score properties mark – properties must apply to material • must use properties from the list but also allow corrosion in the right context • the point must be qualified eg high density not just density <p>allow strong = high tensile strength / won't break</p>		6
Total			9

question	answers	extra information	marks
6(a)	dilute / weaker solution / low concentration	or high water content	1
	strong / concentrated solution	or low water content	1
	semi / partially permeable membrane		1
(b)(i)	comment about chip changing size	or stays the same (length) in $120 \text{ g dm}^{-3} = 2$ marks	1
	correctly linked to concentration		1
(ii)	any three from: <ul style="list-style-type: none"> • cut to equal size or measure to equal cross section • put each piece into different solutions • leave for same amount of time for each chip • remeasure 	ignore the time given do not accept record result	3
Total			8

question	answers	extra information	marks
7(a)	made in large quantities	do not allow made in bulk / used in large quantities	1
(b)(i)	7		1
(ii)	polymer		1
(iii)	ropes etc / clothing / material etc		1
(c)(i)	does not contain carbon or not obtained from living things		1
(ii)	nitrogen		1
	hydrogen		1
(d)(i)	<-196 (⁰ C) to >-273 (^o C)		1
(ii)	(fractional) distillation	do not allow evaporation	1
(e)(i)	sulphuric	allow phonetic spelling	1
(ii)	evaporate (water from) the solution		1
	by heating / leaving (overnight) / use of Bunsen / boiling		1
(iii)	improve crop yield / grow quicker / provide nitrogen / phosphorus / potassium / minerals	allow correct comparison with organic fertiliser do not allow cheaper or nutrients	1
Total			13

question	answers	extra information	marks
8(a)(i)	2622		1
(ii)	2622×7	allow ecf	1
	= 18354 (p) or (£)183.54	do not allow £183 or £184	1
(iii)	6118(p) or (£) 61.18	allow answer to nearest whole number allow ecf	1
(b)(i)	$\frac{18}{6}$	ignore units	1
	= 3		1
(ii)	3 kilowatts = 3000 watts	allow ecf	1
	$\frac{3000}{240}$		1
	= 12.5	ignore units ans 0 .0125 = 2 marks	1
Total			9
Overall marks = 80			