

Science B

General Certificate of Secondary Education

Unit **B621/01**: Unit 1 Modules B1, C1, P1 (Foundation Tier)

Mark Scheme for January 2011

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

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1 Abbreviations, annotations and conventions used in the detailed Mark Scheme.

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
not	= answers which are not worthy of credit
reject	= answers which are not worthy of credit
ignore	= statements which are irrelevant
allow	= answers that can be accepted
()	= words which are not essential to gain credit
<u> </u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW	= alternative wording
ora	= or reverse argument

Question		Expected Answers	Marks	Additional Guidance
	(e)	heat stroke / dehydration / lose too much water or fluid / (high temperatures) kills cells (1)	1	allow (high temperatures) reduces enzyme activity / enzyme denatures / enzyme changes shape (1) ignore excess sweating not kills enzymes ignore strokes / heart attack / heart beats faster / increased blood pressure / overheating / organ failure
		Total	8	

Question			Expected Answers	Marks	Additional Guidance
2	(a)	(i)	protein (1)	1	allow amino acids (1)
		(ii)	12 / twelve (g) (1)	1	
	(b)		genetic / inherited disorder / a defective gene (1)	1	allow passed on from parents (to children) (1) AW must have idea of inherited. ignore "from their parents" allow deformed red blood cells / red blood cells or haemoglobin cannot carry enough oxygen (1) not not enough red blood cells
			Total	3	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	<p>depressants cause muscle development</p> <p>pain killers block nerve impulses ✓</p> <p>performance enhancers can help athletes run faster ✓</p> <p>stimulants decrease the brain's activity</p>	2	each tick over max 2 loses 1 mark
	(b)	(i)	1	<p>allow has to keep taking the drug / can't stop taking it / can't get enough / (psychological) need for it / without it get withdrawal symptoms / want to keep taking it / idea of doing it again and again / will do anything for it (1)</p> <p>ignore needs an increasing dose of the drug</p>
		(ii)	1	<p>ignore "addictive"</p> <p>allow can be used for the wrong reasons / when they are not ill</p>
Total			4	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	eye colour and blood group (1)	1	both needed for mark allow either order
	(b) (i)	24.7 scores (2) 89 / (1.9) ² or 89/3.61 scores (1)	2	allow 24.65 to 24.72 (2) 24.6 scores 1 25 scores 2 but 25.0 scores 1
	(ii)	underweight (1)	1	ignore not heavy enough or below average weight ignore abnormal / not normal ignore anorexic ignore skinny
	(c)	long sight (1)	1	allow hypermetropia (1) ignore needs reading glasses
		Total	5	

Question			Expected Answers	Marks	Additional Guidance
5	(a)	(i)	sodium hydrogencarbonate → sodium carbonate + carbon dioxide + water (1)	1	not '+ heat' in the equation allow '+ heat' above arrow not & or and instead of '+' allow = instead of → not sodium hydrocarbonate allow mix of correct formulae and words, but equation does not need to be balanced e.g. $2\text{NaHCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O}$
		(ii)	carbon dioxide or a gas is made (1)	1	not an incorrectly named gas e.g. nitrogen
	(b)	(i)	prevent reacting with oxygen (1)	1	allow stops food oxidising / stops food going off / increases shelf life / food lasts longer ignore stops food going mouldy
		(ii)	(food) colour(s) / emulsifier / flavour enhancers (1)	1	allow stabilisers / preservatives / sweeteners ignore named examples
			Total	4	

Question			Expected Answers	Marks	Additional Guidance
6	(a)	(i)	heat (1)	1	
		(ii)	electrical (energy) (1)	1	
	(b)	(i)	thermometer (1)	1	
		(ii)	petrol (1) least fuel (1) and same temperature rise (1)	3	mark independently allow all heated up by same amount / all release the same amount of energy (1) allow same temperature rise indicated in table (1) calculation of temperature rise / g in each fuel (2)
Total				6	

Question			Expected Answers	Marks	Additional Guidance
7	(a)	(i)	ethane (1)	1	allow correct formula C ₂ H ₆
		(ii)	propene (1)	1	allow correct formula C ₃ H ₆
	(b)		carbon and hydrogen (1)	1	both required for the mark, either order
	(c)		high pressure (1) (named) catalyst (1)	2	allow any pressure above 1 atmosphere (1) not just pressure ignore high temperature
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
8	(a)	oxygen (1)	1	allow O / O ₂
	(b)	carbon dioxide / CO ₂ (1)	1	ignore steam
	(c)	(carbon monoxide) is poisonous (1)	1	allow less energy / less efficient / carbon monoxide is toxic / carbon monoxide kills people allow higher level answers regarding oxygen carriage ignore carbon monoxide is dangerous / harmful / suffocates
	(d) (i)	3 / three (1)	1	allow C3 or 3C not C ³ allow C ₃
	(ii)	11 / eleven (1)	1	
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
9		analogue (1) electromagnetic (1) reflected (1)	3	
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	water (1)	1	allow H ₂ O allow water and fat allow fat / sugar
	(b)	<p>any two from: warm brain / warm cells / warm tissues / damages brain / cell damage / water molecules inside head / irradiates the brain / damage or denatures enzymes (1)</p> <p>(increase risk of) cancer (1)</p> <p>memory loss (1)</p> <p>headaches (1)</p> <p>sleeping disorders (1)</p> <p>(cyber)bullying / stress accidents caused by person being distracted (1)</p>	2	<p>ignore just warming effect / affects brain / melts brain / cooks brain / kills enzymes</p> <p>allow tumour but causes brain cancer / tumour = 2</p> <p>ignore ear ache / damages the ears</p> <p>allow specific psychological concern ignore dangers of theft</p>
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	reference to curtains (1)	1	allow blinds / shutters / idea of secondary glazing / change the glass allow references to draught excluding / sealing gaps ignore reference to turning down the thermostat / shuts windows
	(b)	(i) idea that fibreglass contains (trapped) air (1) idea that air is (good) insulator or a poor conductor (1)	2	allow air pockets for idea of trapped air reject the idea that the air moves and is then trapped by or in the fibreglass allow fibreglass is a (good) insulator or poor conductor if no other mark scored (1) ignore traps heat any mention of heat particles negates second marking point
		(ii) 5 (1)	1	
	(c)	infrared (1)	1	allow ir if answer line is blank allow correct answer ticked underlined or circled in the list
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
12	(a)	ultraviolet (1)	1	allow uv
	(b)	sunburn / <u>skin</u> cancer / gets burnt / burns the skin / goes red / (1)	1	allow sun / heat stroke allow damage to eyes / retina / cataracts ignore cancer / suntanned / goes brown
	(c)	300 (1)	1	
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
13	(a)	faster / fast (1)	1	allow can be seen over (longer) distances
	(b)	(long and short) flashes or . _ or on and off (1) represent letters or numbers or words or information (1)	2	allow . . . and _ _ _ allow blinks allow flickers on and off but ignore just flickers allow . . . _ _ _ . . . = SOS (2) ignore messages (stem of question)
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
14	(a)	4 °C (1)	1	if answer line is blank allow correct answer ticked underlined or circled in the list
	(b)	rises / goes up / goes to room temperature / goes to 20°C (1)	1	allow gets warmer / gets hotter ignore references to exothermic and endothermic changes
	(c)	joule /J (1)	1	allow kilowatt-hour / kJ / kj / KJ / j allow phonetic spelling
		Total	3	

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