



GCSE

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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- 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

B621/01

Mark Scheme

January 2011

Question			Expected Answers	Marks	Additional Guidance
1	(a)	(i)	<div> <div>disease</div> <div>microorganism that causes the disease</div> <div> <div>athlete's foot</div> <div>cholera</div> <div>dysentery</div> <div>flu</div> </div> <div> <div>virus</div> <div>funqus</div> <div>bacteria</div> <div>protozoa</div> </div> </div>	2	all three correct = (2) marks one or two correct = (1) mark
		(ii)	<u>pathogens</u> (1)	1	ignore germs
	(b)		skin (1)	1	allow blood clotting anticoagulant effect of feeding (1) allow epidermis (1)
	(c)		sucks blood or parasite and passes on to next human it feeds on (1)	1	key is the transfer of (infected) blood or parasite allow suck up the blood from one person and then bite another allow sucks Plasmodium and passes on to next human by biting ignore bacteria ignore just feeding on one person and then another ignore transfer of disease or illness
	(d)		mosquitoes do not live here / mosquitoes die (1) wrong climate / not tropical / too cold (1) use of insecticides (1) better health care (1)	2	allow o.r.a mosquitoes live in hot areas / wrong climate for the mosquitoes = 2 mosquitoes killed by insecticide = 2 ignore injections or vaccinations to prevent getting malaria ignore richer countries

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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)	body dependent on drug / body "craves" more AW (1)	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)	harmful or dangerous / side effects / to restrict the use / it can be abused / people may overdose on it (1)	1	<p>ignore "addictive"</p> <p>allow can be used for the wrong reasons / when they are not ill</p>
			Total	4	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

Question			Expected Answers	Marks	Additional Guidance
5	(a)	(i)	sodium hydrogencarbonate \rightarrow sodium carbonate + carbon dioxide + water (1)	1	not '+ heat' in the equation allow '+ heat' above arrow not & or and instead of '+' allow = instead of \rightarrow 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	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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

B621/01

Mark Scheme

January 2011

Question			Expected Answers	Marks	Additional Guidance
10	(a)		water (1)	1	allow H ₂ O allow water and fat allow fat / sugar
	(b)		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) (increase risk of) cancer (1) memory loss (1) headaches (1) sleeping disorders (1) (cyber)bullying / stress accidents caused by person being distracted (1)	2	ignore just warming effect / affects brain / melts brain / cooks brain / kills enzymes allow tumour but causes brain cancer / tumour = 2 ignore ear ache / damages the ears allow specific psychological concern ignore dangers of theft
			Total	3	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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	

B621/01

Mark Scheme

January 2011

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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