

Science B

General Certificate of Secondary Education

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

Mark Scheme for June 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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The **Abbreviations, annotations and conventions** used in the detailed Mark Scheme are:

/	=	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
1	a	i	65 (pulses per min) (1)	1	allow answer in range 64-66
		ii	6 (minutes)	1	
	b		oxygen / glucose (1) carbon dioxide / heat (1)	2	allow correct formulae O_2 / $C_6H_{12}O_6$ allow sugar not food ignore blood ignore waste products allow (remove) lactic acid not just lactic
	c	i	(clinical / digital) thermometer (1)	1	allow heat sensitive strip / temperature probe / thermal imaging ignore temperature sensor
		ii	37°C (1)	1	
		iii	maintain temperature / because she produces (extra) heat during exercise / lose heat / cool down (1)	1	allow higher level answers: avoid enzyme damage / avoid tissue damage allow stop her from overheating
			Total	7	

Question			Expected Answers	Marks	Additional Guidance
2	a	i	3 rd box / cystic fibrosis (1)	1	
		ii	nucleus / chromosome (1)	1	allow DNA
		iii	mutation (1)	1	allow higher level answers: deletion / addition / substitution / inversion not denaturing
		iv	100% (1)	1	
		v	C (1)	1	
	b	i	depressant (1)	1	allow sedative
		ii	blurred (vision) (1)	1	allow double vision ignore effects eyesight
			Total	7	

Question			Expected Answers	Marks	Additional Guidance
3	a	i	kwashiorkor (1)	1	
		ii	30 (g)	1	allow 0.03 kg NOT 30 kg
		iii	contain (all) essential amino acids / contain amino acids that cannot be made by body (1)	1	ignore references to proteins
	b		reference to mosquitoes (1) (correct) reference to parasite / plasmodium / protozoa (1) reference to (feeding on) blood (1)	3	allow phonetic spellings ignore references to vector unless qualified NOT bacteria or virus allow pathogen allow sucking blood / transfer through the blood ignore references to merely biting
			Total	6	

Question		Expected Answers	Marks	Additional Guidance
4	a	<p>any two from: improve the taste (1) improve the flavour (1) (high temperature) kills microbes / kills bacteria / kills named bacteria e.g. salmonella / kills virus (1)</p> <p>easier to digest (1)</p> <p>denatures the protein (1)</p>	2	<p>ignore taste / flavour unqualified allow change taste / tastes better allow change flavour ignore kills germs allow to avoid getting salmonella / food poisoning ignore named symptoms of food poisoning e.g. vomiting / tummy upset ignore it is safer</p> <p>allow aids digestion ignore easier to eat / to make it edible</p> <p>ignore denatures food ignore improves or changes appearance</p>
	b	becomes soft(er) / aw (1)	1	<p>answer must imply a change ignore its soft ignore fluffy / crispy</p>
	c	baking powder (1)	1	allow correct answer ticked, circled or underlined in list if answer line is blank
		Total	4	

Question			Expected Answers	Marks	Additional Guidance
5	a	i	poly(ethene) (1)	1	N.B. mark is not for 'poly' on its own allow polyethene / polythene
		ii	nylon and polyester (1)	1	both required for 1 mark
	b		(polymer) D (it can be melted and) moulded into shape / is stiff (and holds its shape) / will not melt with hot or boiling water or in use (1)	1	no mark unless D mark is for explanation allow it is easily coloured (so can be made in a range of colours) allow melting point is above 100°C ignore high melting point one incorrect answer in the list scores 0
	c		monomers (1) polymerisation (1)	2	allow addition (polymerisation) / condensation (polymerisation)
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
6	a	14 (1)	1	
	b	C_3H_8 (1)	1	not C^3H^8 / C3H8 allow H_8C_3 If no answer in table mark answer written by question
	c	i	26 (1)	1
		ii	any two from: complete combustion (takes place) (1) less soot (1) less carbon monoxide (1) more heat or energy transferred / heats up faster / hotter flame / temperature increases at a faster rate (1)	2 ignore better combustion / more efficient combustion allow cleaner flame ignore references to smoke / fumes allow less poisonous / toxic gases allow higher temperature rise ignore cheaper / references to cost ignore references to oxygen allow alternative correct responses if candidate refers to yellow flame
		Total	5	

Question			Expected Answers	Marks	Additional Guidance
7	a	i	B (1)	1	
		ii	E (1)	1	
	b	i	(organic) acid(s) (1)	1	allow named organic acid / carboxylic acid e.g. ethanoic acid NOT hydrochloric / sulfuric / nitric acid / phosphoric
		ii	plants / flowers / petals / leaf (1)	1	allow any named flower / herb / spices allow musk allow vanilla allow fruit or named fruit
		iii	(perfumes) stimulate sense cells (in the nose) (1)	1	allow olfactory cells / smell receptors
		iv	to ensure they are safe (to use) / to see side effects / to see if they irritate or harm or damage (skin) (1)	1	allow to see if they are ok to use ignore cause reaction (to humans) allow in case it causes a bad or allergic reaction (to humans) the response should imply that there are no unwanted effects
Total				6	

Question			Expected Answers	Marks	Additional Guidance
8	a	(i)	gas barbeque (1)	1	allow 400°C (1) more than one answer scores (0) mark answer on the line first. If no answer on the line then take the answer indicated on the list.
		(ii)	pan (1) gas barbeque (1)	2	either order scores 2 mark answer on the line first. If no answer on the line then take the answer indicated on the list.
	b		idea of IR or heat reflecting (1)	1	ignore bounces allow higher level answers in terms of reduced radiation not references to insulation not references to reflecting sun light / sun rays
Total				4	

Question		Expected Answers	Marks	Additional Guidance
9	a	microwave (1)	1	more than one answer scores (0) mark answer on the line first. If no answer on the line then take the answer indicated on the list.
	b	infrared (1)	1	more than one answer scores (0) mark answer on the line first. If no answer on the line then take the answer indicated on the list.
	c	(brain) cancer risk (1)	1	ignore costs allow any damage to brain/ inhibits brain development (1)
	d	any two from: portable / convenient (1) available 24/7 (1)	2	allow easy to use (1) allow remote use e.g. operate from a distance (1) allow less dangerous than having wires about (1) allow can easily use more than one device at the same time (1)
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
10	a	<p>any two from:</p> <p>skin cancer (1)</p> <p>(sun) burn (1)</p> <p>skin aging / drying / cracking (1)</p> <p>eye damage (1)</p>	2	<p>accept for additional marking point higher level answers in terms of descriptions of the harm caused eg skin cancer due to mutations in skin cells (2)</p> <p>not just cancer</p> <p>allow skin damage (1) if no other mark given</p> <p>ignore harmful by itself</p> <p>ignore just affects the skin</p> <p>allow eyesight damage / blindness</p>
	b	<p>reduce (risks of) / burning / skin damage / skin cancer (1)</p> <p>longer (safe) time in sunshine / AW (1)</p>	2	<p>ignore stops burning etc.</p> <p>higher protection from the sun scores 0</p> <p>allow protects for longer</p> <p>ignore lasts longer</p> <p>allow to spend longer in the sun without burning (2)</p>
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
11	a	(3) waves per second / number of waves that pass per unit time / AW (1)	1	<p>allow oscillations / vibrations / cycles per second or per unit time</p> <p>allow waves per minute</p>
	b	<p>0.12 (m/s) scores (2)</p> <p>but if answer incorrect then 0.04 x 3 (1)</p>	2	<p>allow 12 cm/s (2)</p> <p>but if answer incorrect allow 3 x 4 (1)</p>
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
12	a	reflection (1)	1	not refraction
	b	on or off / 0 or 1 / high or low (1) varying value / changing value AW (1) pulses (1)	3	either order look for the idea of variation ignore alternating ignore reference to frequency / wavelength / voltage / current on their own allow short bursts / flashes / bursts / packets / chunks / AW (1) ignore beams / rays / reflections
		Total	4	

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