



**General Certificate of Secondary Education**

**Applied Science (Double Award)  
4861**

**APSC/2F Science for the Needs of Society**

**Mark Scheme**

*2008 examination – June series*

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**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
<b>1(a)(i)</b>	antiseptic		1
<b>1(a)(ii)</b>	any <b>one</b> from: <ul style="list-style-type: none"> <li>• wash the skin/ clean the wound</li> <li>• plaster/ bandage/ dressing/ cover the wound/ close the wound</li> <li>• mask/ gloves/ clean hands</li> </ul>		1
<b>1(b)(i)</b>	platelets		1
<b>1(b)(ii)</b>	white blood cells		1
<b>1(c)</b>	gland(s)		1
	water/ liquid	allow moisture	1
	larger / wider / bigger/ expanded/ thicker	<b>not</b> higher	1
	blood	<b>not</b> red blood cells	1
<b>1(d)</b>	insulation		1
	conduction		1
<b>Total</b>			<b>10</b>

question	answers	extra information	marks
2(a)(i)	PVC/ nylon/ polyethene/ cotton	allow name of appropriate object e.g. pipes/ guttering/ window frame/ curtains/ curtain fittings  <b>not</b> loft insulation	1
2(a)(ii)	concrete / MDF / fibreglass	allow roof tiles/ kitchen units	1
2(a)(iii)	brass / stainless steel	allow door handle/ sink	1
2(a)(iv)	cotton / wood	allow curtains/ floor	1
2(a)(v)	marble	allow worktop	1
2(b)	any <b>two</b> from:  <ul style="list-style-type: none"> <li>• cavity wall (insulation)/ correct description of cavity wall insulation</li> <li>• loft insulation</li> <li>• double glazing</li> </ul>	insulation = <b>1</b> mark	2
2(c)	Measure out sand + cement  add water  mix together	only scored if “add water” is present	1  1  1

<b>2(d)</b>	wind/solar	1 <sup>st</sup> mark for solar / wind etc	1
	wind <u>turbine</u> (in garden)	2 <sup>nd</sup> mark for link to device	1
	<b>or</b>		
	solar <u>cells</u> (on roof)	e.g. solar panels = <b>2</b> marks e.g. wind turbine = <b>2</b> marks	
	<b>or</b>		
	solar <u>panels</u> (on roof)		
<b>Total</b>			<b>12</b>

question	answers	extra information	marks
3(a)	heat		1
	water		1
	steam		1
	turbine		1
	generator		1
3(b)	recycle the waste heat		1
3(c)	<ul style="list-style-type: none"> <li>carbon dioxide/ sulfur dioxide/ soot</li> </ul>	<b>not</b> smoke	1
	<ul style="list-style-type: none"> <li>damage explained e.g. greenhouse effect/ acid rain</li> </ul>	damage must be linked to pollution allow <b>1</b> mark for ‘damage caused to environment by mining’ <b>not</b> damage to the ozone layer ignore finite resource do <b>not</b> accept vague answers e.g. air pollution/ kill plants	1
3(d)(i)	no CO <sub>2</sub> produced/ no SO <sub>2</sub> produced/ less soot/ less <u>air</u> pollution/ less global warming	<b>not</b> : no/less pollution/ renewable/ plentiful supply/ cheaper/ produces more electricity	1
3(d)(ii)	radiation/ radioactive (emissions)/ disposal of waste/ causes cancer/ risk of disaster/ explosion	ignore more pollution	1
<b>Total</b>			<b>10</b>

question	answers	extra information	marks
4(a)(i)	more males smoke/ females smoke less	ignore answers that attempt to explain why	1
4(a)(ii)	decrease in male smokers / similar number of male and female smokers	do <b>not</b> allow more women smoking/ less people smoking	1
4(a)(iii)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• similar number of cases of males and females with lung cancer</li> <li>• lower percentage of male cancers</li> <li>• less cancer cases overall</li> </ul>		1
4(b)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• cigarette smoke contains <u>nicotine</u></li> <li>• addictive drug / smokers get dependent/ habit/ reduces stress</li> <li>• suffer withdrawal symptoms/ craving</li> </ul>		2
4(c)	red oxygen		1 1
4(d)(i)	X-rays gamma rays		1 1
4(d)(ii)	lead shield / move to a different room / monitor exposure	only allow 'protective clothing' if there is a reference to it stopping radiation	1
<b>Total</b>			<b>10</b>

question	answers	extra information	marks
5(a)(i)	aluminium		1
5(a)(ii)	7.5		1
5(b)(i)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• bulb lights/ gets hot</li> <li>• metal gets hot/ glow</li> </ul>		1
5(b)(ii)	good electrical conductor		1
5(b)(iii)	shiny		1
5(c)(i)	high melting point		1
5(c)(ii)	bricks / crucibles / cups / toilets/ hair straighteners/ sinks/ tiles/ pottery/ jewellery/ hob	<b>not</b> just cooking	1
5(d)(i)	iron		1
	sulfur	accept sulphur	1
5(d)(ii)	compound		1
5(d)(iii)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• pipes/ (electrical) wiring / hot water cylinder/ roofing</li> <li>• used to make e.g. brass/ musical instruments/ coins/ jewellery/ circuit boards</li> </ul>		1
<b>Total</b>			<b>11</b>



question	answers	extra information	marks
6(a)(i)	$230 \times 4.1$	correct answer alone = <b>2</b> marks	1
	= 943	no marks for 0.943	1
6(a)(ii)	$943 / 1000 = 0.943$	allow error carried forward from 6(a)(i)	1
6(b)(i)	$1.5 \times 0.4$	correct answer alone = <b>2</b> marks	1
	= 0.6		1
6(b)(ii)	$0.6 \times 8$	allow error carried forward from 6(b)(i)	1
	= 4.8		1
6(c)	3		1
	13		1
6(d)	can be reset / does not need to be replaced / disconnect at the correct current / trip sooner	<b>not</b> 'safer' unless explained	1
<b>Total</b>			<b>10</b>

question	answers	extra information	marks
7(a)(i)	more chloroplasts/ chlorophyll	not bigger chloroplast ignore reference to vacuole	1
7(a)(ii)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• leaf cells (exposed) to light/ sun</li> <li>• (more) photosynthesis</li> <li>• make sugar / glucose / food</li> </ul>	mark independently from 7(a)(i)	2
7(b)(i)	sheltered/ warmer/ hotter/ less windy/ protected from the cold (OWTTE)	ignore reference to water/ sunlight/pests/fertilizers/carbon dioxide  ignore 'right' / 'controlled' temperature  do <b>not</b> accept 'controlled conditions' (too vague)	1
7(b)(ii)	carbon dioxide needed for photosynthesis / <u>more</u> photosynthesis  <u>more</u> sugar/ <u>more</u> glucose/ <u>more</u> food produced	<b>not</b> carbon dioxide helps plant to grow  allow bigger plants/ faster growth	1  1
7(c)(i)	(artificial) fertiliser / pesticide / herbicide / fungicide/ GM crops	<b>not</b> 'chemicals' accept specific name  <b>not</b> manure (organic) but allow error carried forward  allow indoors under artificial light/ cloning	1
7(c)(ii)	e.g. more minerals in soil (allow more nutrients) / kills insects / kills weeds / kills mould/ disease resistance	must link to answer in part (i)  ignore makes crops grow faster/ better	1

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7(c)(iii)	e.g. eutrophication / destroys natural habitat / kills wild plants/ unknown effects of GM crops	must link to answer in part (i)  allow answers based on energy production and fossil fuels/ toxic effect of nitrates	1
<b>Total</b>			<b>9</b>

question	answers	extra information	marks
8(a)	calcium carbonate / limestone		1
8(b)(i)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• water (pumped) down/ in</li> <li>• salt dissolves/ forms solution</li> <li>• <u>solution</u> (pumped) up/ out</li> </ul>		2
8(b)(ii)	heat/use of bunsen burner/ leave (to dry)	allow boil water off = <b>2</b> marks	1
	to remove water/ evaporation/ dry	leave to evaporate = <b>2</b> marks	1
8(c)	CO <sub>2</sub>	allow in any order	1
	H <sub>2</sub> O	formula must be correct	1
8(d)(i)	limestone/ sand/ calcium/ carbonate		1
8(d)(ii)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• plastic / metal used to make containers</li> <li>• glass easily broken/ heavier</li> <li>• other materials are stronger/ lighter</li> </ul>	must name the alternative material  ignore cost	1
<b>Total</b>			<b>9</b>

question	answers	extra information	marks
9(a)(i)	curve goes through all 3 points	must be a smooth, single line ignore line outside the points	1
9(a)(ii)	point plotted at 108 and on the curve +/- a small square		1
9(a)(iii)	220 days or value from candidate's graph		1
9(b)(i)	gamma (rays)/ $\gamma$		1
9(b)(ii)	radio waves (mostly) pass through atmosphere		1
9(b)(iii)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• no/less light pollution</li> <li>• less atmosphere to pass through</li> <li>• cleaner air</li> <li>• low environmental vibration</li> <li>• no/less clouds/ clear sky</li> </ul>	ignore trees and buildings <b>not</b> 'no atmosphere' allow less interference from electromagnetic radiation	2
9(c)(i)	lower frequency/ red shift	<b>not</b> less radiation	1
9(c)(ii)	(distant) galaxies are moving away / universe is expanding	allow stars are moving away/ reference to big bang	1
<b>Total</b>			<b>9</b>