

Applied Science (Double Award)

General Certificate of Secondary Education **GCSE 1497**

Mark Schemes for the Units

January 2007

1497/MS/R/07J

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

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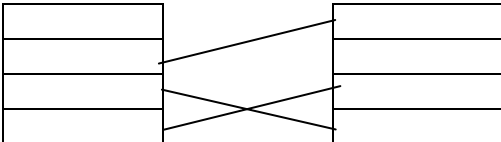
General Certificate of Secondary Education

GCSE Applied Science (Double Award) 1497

MARK SCHEMES FOR THE UNITS

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4882/01	Science for the Needs of Society (Foundation Tier)	1
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*	Grade Thresholds	12

**Mark Scheme 4882/01
January 2007**

Question	Expected Answers	Mks	Additional Guidance									
1 a		2	all 3 correct = 2 2/1 correct = 1									
b	<table border="1"> <tr> <td></td> <td>gas</td> <td>✓</td> </tr> <tr> <td>gas</td> <td>liquid</td> <td>✓</td> </tr> <tr> <td>liquid</td> <td>liquid</td> <td>✓</td> </tr> </table>		gas	✓	gas	liquid	✓	liquid	liquid	✓	3	
	gas	✓										
gas	liquid	✓										
liquid	liquid	✓										
c	mix; qualified e.g. oil and water separate / to get even amount or spread on hair	2										
di	wear gloves / face mask or goggles	1	protective clothing is insufficient									
dii	NH ₃ ; H ₂ SO ₄ ;	2										
diii	bulk: ammonia and sulphuric acid; fine: hair dye and shampoo;	2	1/2 correct = 1 3/4 correct = 2									
Total		12										

Question	Expected Answers	Mks	Additional Guidance
2 a	first four plots correct; horizontal plots correct; line of best fit;	1 1 1	±½ division
b	(initially) fall; (finally) levels; OR lower than other (bulbs); same shape as other (bulbs);	1 1	ecf ACCEPT starts lower
ci	A C B;;	2	3 correct = 2 2/1 correct = 1
cii	B; all have same energy <u>input</u> ; B has greater / greatest light output; B has less / least heat;	1 2 max	ecf letter from ci
d	use less power; don't get hot;	1 1	
Total		12	

Question	Expected Answers	Mks	Additional Guidance
3 a i	fungi;	1	
ii	boiling would kill it;	1	
iii	yeast reproduces / multiplies;	1	ACCEPT grows
iv	alcohol; carbon dioxide;	1 1	
b	food (for yeast);	1	
c i	cell wall / membrane; nucleus;	1 1	
ii	yeast has no vacuole; yeast has no chloroplast / chlorophyll; yeast has thin cell wall;	2 max	ACCEPT no cell wall if not labelled as cell wall on ci
iii	osmosis	1	ACCEPT diffusion
Total		11	

Question	Expected Answers	Mks	Additional Guidance									
4 a	vaccine injected / orally / scratched; vaccine contains dead / weakened form of disease; vaccine contains antigens; antigens are identifiers of a disease; antibodies are <u>made</u> ; antibodies are produced by <u>wbc</u> ; antibodies are specific to a disease / can be made quickly on re-infection;	3 max										
b	<table style="border: none; width: 100%;"> <tr> <td style="width: 33%;">virus</td> <td style="width: 33%;">polio</td> <td style="width: 33%;">paralysis</td> </tr> <tr> <td>bacteria</td> <td>tuberculosis</td> <td>cough</td> </tr> <tr> <td>fungus</td> <td>athletes foot</td> <td>cracked skin</td> </tr> </table> 	virus	polio	paralysis	bacteria	tuberculosis	cough	fungus	athletes foot	cracked skin	4 max	mark each column separately 3 correct =2 1/2 correct =1
virus	polio	paralysis										
bacteria	tuberculosis	cough										
fungus	athletes foot	cracked skin										
c	bacteria; only bacteria killed by antibiotic;	1 1	ACCEPT fungi									

Question	Expected Answers	Mks	Additional Guidance
4 d	washing; hair tied back / short hair sterilising; using disinfectants; using antiseptics; using bleaches; antibacterial sprays etc; safe storage e.g. refrigeration; separation of foods;	2 max	ALLOW other reasonable examples IGNORE keep clean alone
Total		11	

Question	Expected Answers	Mks	Additional Guidance
5 a	useful source of energy; Box 2 supplies are limited; Box 3	1 1	
b i	no / stays the same; idea of no chemical change / reaction;	1 1	
ii	correct method (ALLOW one arithmetic error); 82;	1 1	
iii	heat energy spreads out / lost from house / to surroundings	1	
iv	heat	1	
c	more chemical energy.....; Box 1 much less heat energy lost to atmosphere; Box 5	1 1	
d	correct reference to <u>global warming</u> / <u>greenhouse effect</u> / <u>climate change</u> ; an example of a specific environmental effect e.g. desertification, flooding;	1 1	IGNORE reference to temperature increases IF ozone layer mentioned max 1 mark
e	no because it cannot be replaced / finite resource	1	idea of reused is wrong
Total		13	

Question	Expected Answers	Mks	Additional Guidance
6 a	no need to wash / collect; break is less of problem; lighter; easier to store; better hygiene; take away easier;	any 2	IGNORE recycle / thermal arguments
b	litter; space in landfill; idea of waste of resources; non-biodegradable; burning gives off toxic gases;	any 2	
ci	removes dust / dirt / solids / bits of plastic	1	
cii	fractional distillation	1	
ciii	anywhere below bottom dotted line	1	NOT in tar pipe
d	B before D; D before A;	1 1	
ei	carbon in it	1	IGNORE hydrogen
eii	C ₂ H ₆	1	
Total		11	

Mark Scheme 4882/02
January 2007

Question	Expected Answers	Mks	Additional Guidance																		
1 a	vaccine injected / orally / scratched; vaccine contains dead / weakened form of disease; vaccine contains antigens; antigens are identifiers of a disease; antibodies are <u>made</u> ; antibodies are produced by <u>wbc</u> ; antibodies are specific to a disease / can be made quickly on re-infection	3 max																			
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b i	no / Stays the same; idea of no chemical change/reaction	1 1	
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iv	heat;	1	
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Question	Expected Answers	Mks	Additional Guidance
2 d	correct reference to <u>global warming</u> / <u>greenhouse effect</u> / <u>climate change</u> ; an example of a specific environmental effect e.g. desertification, flooding;	1 1	IGNORE reference to temperature increases IF ozone layer mentioned max 1 mark
e	no because it cannot be replaced / finite resource;	1	idea of reused is wrong
Total		13	

Question	Expected Answers	Mks	Additional Guidance
3 a	no need to wash / collect; break is less of problem; lighter; easier to store; better hygiene; take away easier;	any 2	IGNORE recycle / thermal arguments
b	litter; space in landfill; idea of waste of resources; non-biodegradable; burning gives off toxic gases;	any 2	
c i	removes dust / dirt / solids / bits of plastic;	1	
c ii	fractional distillation;	1	
c iii	anywhere below first dotted line;	1	NOT in tar pipe
d i	organic	1	
d ii	contains carbon	1	
e	crude oil is a fossil fuel; crude oil is finite / non renewable; saves oil for <u>other uses</u> ; crude oil needs to be extracted; getting fuel from waste / don't have to buy fuel; no need to transport / already there;	3	
Total		12	

Question	Expected Answers	Mks	Additional Guidance
4 a	convection; <u>hot water</u> rises / <u>cold water</u> falls; hot water is less dense;ORA	2	IGNORE heat rises / falls
b i	2000W = 2kW; (stated or used) 2 x 8 = 16 (kWh)	2	16 000 scores (1)
ii	16 x 9 x 5 = £7.20 / 720 p ALLOW ecf	1	must have £ or p sign
c i	power = voltage x current;	1	
ii	current = power / voltage; (stated or used); = 2 000 / 230 = 8.7; A / Amps;	3	
d	less electricity used; non radiating / fibre padding <u>therefore less heat</u> / <u>energy lost</u> ; glass fibre acts as insulator; uses less energy / more <u>energy</u> efficient;	3	
Total		12	

Question	Expected Answers	Mks	Additional Guidance
5 a	liquid gas gas liquid gas and liquid given in both lines (either order) = (1) correct order = 2	2	
b	aerosol; foam;	2	
c	H ₂ SO ₄	1	
d i	bulk large scale / fine small scale / bulk coarse quality / continuous processing / usually single compound rather than mixture	1	
ii	quality control / used on people idea	1	
e i	3 bonding pairs shown; rest of electrons correct on N (no more on H);	2	
ii	protons <u>and</u> neutrons	1	both needed
Total		10	

Question		Expected Answers	Mks	Additional Guidance
6	a	fourth box; <i>third box;</i>	1 1	
	b	continuous light / heat / water; CO ₂ given out by heater; more growth / increase rate of growth; Increased photosynthesis / able to make more food; increased <u>rate</u> of photosynthesis; no limiting factor;	3	increased <u>rate</u> of photosynthesis = 2 IGNORE competition arguments
	c	nitrates protein; magnesium chlorophyll; 	1 1	
	d	any 2 from: plants make glucose / starch / food; (photosynthesis uses) carbon dioxide and water; minerals are essential compounds / needed to make chlorophyll / for photosynthesis;	2	
	e	✓; x x ✓; x ✓;	3	all correct = 3 4 correct = 2 3/2 correct = 1
<i>Total</i>			12	

General Certificate of Secondary Education
Applied Science (Double Award) 1497
January 2007 Assessment Series

Unit Threshold Marks

Unit		Max Mark	a*	a	b	c	d	e	f	g	Total Number of Candidates
4881	Raw	50	45	41	37	33	27	21	15	9	3268
	UMS	100	90	80	70	60	50	40	20	30	
4882/1	Raw	70	-	-	-	40	33	27	21	15	6853
	UMS	69	-	-	-	60	50	40	20	30	
4882/2	Raw	70	53	44	35	27	20	16	-	-	1736
	UMS	100	90	80	70	60	50	40	-	-	
4883	Raw	50	47	42	37	33	27	21	16	11	387
	UMS	100	90	80	70	60	50	40	20	30	

Specification Aggregation Results

Overall threshold marks in UMS (i.e. after conversion of raw marks to uniform marks)

	Max Mark	A*A*	AA	BB	CC	DD	EE	FF	GG
1497	300	270	240	210	180	150	120	90	60

The cumulative percentage of candidates awarded each grade was as follows:

	A*A*	AA	BB	CC	DD	EE	FF	GG	Total Number of Candidates
1497	0.0	0.0	15.1	81.3	100.0	100.0	100.0	100.0	180

For a description of how UMS marks are calculated see:
http://www.ocr.org.uk/exam_system/understand_ums.html

Statistics are correct at the time of publication.

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