OCR
RECOGNISING ACHIEVEMENT

GCSE

Applied Science Double Award

General Certificate of Secondary Education **J649**

Mark Schemes for the Units

January 2008

J649/MS/R/08J

Oxford Cambridge and RSA Examinations

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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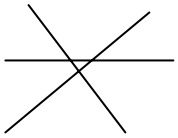
CONTENTS

GCSE Applied Science Double Award (J649)

MARK SCHEMES FOR THE UNITS

B482/01 Foundation Tier

Question			Expected answers	Mks	Additional Guidance
1	a	i	48 + 37 + 12 / = 97; 3 %	2	**If blank look in table** 3% = (2)
		ii	high temp / (very) hot; quotes 1170 ^{o}C; above boiling point of water / evaporates / / vaporises /boils / forms steam;	any 2	
		iii	sulphur dioxide; other gases; carbon dioxide; water (vapour);	2	all 4 correct = 2 2 / 3 correct = 1 1 correct = 0
	b	i	oxygen; nitrogen;	2	**Either order**
		ii	no / less oxygen; could cause suffocation; no respiration possible; (volcano) gases are <u>poisonous / harmful</u>; identifies carbon dioxide / sulfur dioxide as causing health problem; ash / dust / particles;	any 2	**IGNORE** 'dangerous gases' **IGNORE** 'can't breathe' alone
			Total	**10**	

Question			Expected answers	Mks	Additional Guidance
2	a	i	cell wall; nucleus; chloroplast; cytoplasm;	3	all correct = 3 2 / 3 correct = 2 1 correct = 1
		ii		2	All 3 correct = 2 1 / 2 correct = 1
	b	i	both green; both photosynthesise; both have cell walls;	any 2	
		ii	no chloroplasts	1	**Ignore** colour
	c		herbicides are harmful / toxic / cause illness (to humans); herbicides damage other plants / animals / dogs (in the reservoir); would get into drinking water;	2	
			Total	**10**	

Question			Expected Answers	Mks	Additional Guidance
3	a		IN: zinc ore, coke, (blast of) air; (1) OUT: carbon dioxide, sulphur dioxide; (1) ash (1)	3	**IGNORE** waste gases as a product
	b		iron	1	**ACCEPT** copper / lead
	c		calcium carbonate; CaO; CO_2;	3	**DO NOT ACCEPT** CAO, CO2, CO^2
	d	i	all strong / strength; all long life / useful life;	2	
	d	ii	(lower) density / light	1	
			Total	**10**	

Question			Expected Answers	Mks	Additional Guidance
4	a		close contact idea / touching; coughing / sneezing / breathing on; droplets / blood transferred; through the air; using same cups etc / touching same objects;	any 2	
	b		no touching idea; keep her distance; wear a mask; wash hands / hygiene idea / use disinfectant; have a vaccination;	any 2	
	c		viruses; antibodies; white; mumps;	4	
	d	i	blood is not pumped around body as well; blood carries oxygen / less oxygen reaches muscles; blood carries glucose /sugar/food /less sugar reaches muscles; needed for respiration;	any 2	
		ii	smoking and drinking cause heart problems / clog up arteries etc.; exercise strengthens heart / makes heart fitter;	2	**IGNORE** 'they…. **IGNORE** references to heart rate
				12	

Question			Expected Answers	Mks	Additional Guidance
5	a		mixture	1	
	b	i	continuous phase: SOLID; dispersed phase: LIQUID;	2	**ALLOW** (1) for liquid – solid;
		ii	foam	1	
	c		dissolved (in water);	1	
	d		use less sugar;	1	
	e	i	waterproof / non toxic / stiff / flexible / hard / strong / does not crack when cold / non-stick;	1	**IGNORE** easy to shape
		ii	softens / changes shape (when heated);	1	**ACCEPT** melts **NOT** burns
			Total	**8**	

6	a	i	**any two from** double glaze windows / layers of fibre glass in loft / draught proofing	1	**TWO** required **ACCEPT** loft insulation **IGNORE** roof insulation
		ii	stops or reduces energy transfer / stops or reduces heat transfer / less or no heat passes through / less heat loss / more heat kept in;	1	**IGNORE** STOPS heat loss / no heat loss/ keeps heat in
	b		solids; gases; gases	3	
	c	i	time it takes until savings equal cost;	1	
		ii	115.50 ÷ 10.50 11	2	award both marks for correct answer of 11
	d		cost / £4000; payback time / over 20 years;	2	OWTTE
			Total	**10**	

B482/02 Higher Tier

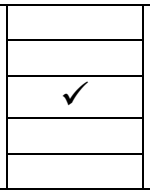
Question			Expected Answers	Mks	Additional Guidance
1	a		mixture	1	
	b	i	continuous phase: SOLID; dispersed phase: LIQUID;	2	**ALLOW** (1) for liquid – solid;
		ii	foam	1	
	c		dissolved (in water);	1	
	d		use less sugar;	1	
	e	i	waterproof / non toxic / stiff / flexible / hard / strong / does not crack when cold / non-stick / not reactive;	1	**IGNORE** easy to shape
		ii	softens / changes shape (when heated);	1	**ACCEPT** melts **NOT** burns
			Total	**8**	

2	a	i	**Any two from** double glaze windows / layers of fibre glass in loft / draught proofing	1	**TWO** required **ACCEPT** loft insulation **IGNORE** roof insulation
		ii	stops or reduces energy transfer / stops or reduces heat transfer / less or no heat passes through / less heat loss / more heat kept in;	1	**IGNORE** STOPS heat loss / no heat loss/ keeps heat in **ALLOW** reduction in (heat) conduction
	b		solids; gases; gases	3	
	c	i	time it takes until savings equal cost;	1	
		ii	115.50 ÷ 10.50 11	2	award both marks for correct answer of 11
	d		cost / £4000; payback time / over 20 years;	2	OWTTE
			Total	**10**	

Question			Expected Answers	Mks	Additional Guidance
3	a		**raw materials:** zinc (ore), coke, (blast of) air **main product:** impure zinc **waste:** carbon dioxide, sulphur dioxide, ash	1 1 2	all 3 required **IGNORE** oxygen all correct = 2 2 correct = 1 **ALLOW** 'waste gases and ash' for 1 mark
	b		2; Zn and CO_2	1 1	**NOT** if ZnO altered **NOT** CO^2 Co_2
	c	i	diagram 1	1	
		ii	Zn smaller than Cu / more Cu than Zn	1	ora
		iii	to resist wear / won't bend / break	1	**ACCEPT** lasts longer **IGNORE** melting
		iv	in metals small fractures propagate / atoms can slide past each other; different size atom; disrupts regular pattern; stop (layers) sliding over each other / move over each other; which prevents fractures propagating;	any 2	
			Total	**11**	

Question			Expected Answers	Mks	Additional Guidance
4	a		**cost:** organic more expensive; organic low yield; organic less pesticides; both use fertilisers / machinery; organic more land; organic more labour; **environment:** 'intensive' more use of pesticides / kills more insects; intensive' more use of herbicides; toxicity in food chain; both use of fertilisers; fertilisers run off / eutrophication; 'intensive' monoculture issues eg disease spread; 'intensive' habitat loss / hedgerow loss; organic uses more land; **animal welfare:** 'intensive' overcrowding; 'intensive' short life; 'intensive' quality of life poor eg no natural light; 'intensive' no freedom / caged; 'intensive' distresses animals; 'organic' better animal welfare / 'organic' more care;	any 2 any 2 any 2	ora for each ora for each **IGNORE** 'chemicals' or 'pollution' ora for each accepted examples
	b		bar for wheat higher; bars for weeds and pests lower;	1 1	
	c		DDT is an insecticide; toxic / accumulation in food chain; BSE / CJD: disease in cattle; can be transferred to humans; link to protein in animal feed;	2	
			Total	**10**	

Question			Expected Answers	Mks	Additional Guidance
5	a		✓ ✓ ✓ 	1 1 1	
	b	i	X – anywhere on or between central dark strips	1	**ACCEPT** on front of ridge diagram – above label line
		ii	similar <u>pattern</u> on each side / reflected <u>pattern</u> each side / pattern parallel to mid-ocean ridges / rocks on each side formed together;	1	
	c		particles move apart; density decrease; less dense material rises; hot particles / rock rises cool particles fall energy / heat lost at top / surface;	any 3	ora **DO NOT ACCEPT** 'particles less dense' 'heat rises'
			Total	**8**	

Question			Expected Answers	Mks	Additional Guidance
6	a	i	bacteria	1	
		ii	virus / fungi	1	
		iii		1	
	b		ideas of: variation present / mutation; some bacteria survive antibiotic; these bacteria reproduce; offspring inherit resistance	any 3	if say MRSA is virus – max 2 marks if describe natural selection for other than MRSA then max 2 marks
	c	i	temp monitored by receptors / sensors; detected in brain; example of mechanism; eg sweat / shivering whether mechanism reduces or increases temp; eg sweat reduces / shivering increases	any 1 1 1	
		ii	constant / steady; internal conditions;	1 1	
		iii	(increase) in CO_2 (in blood); detected / monitored; brain increases breathing rate;	any 2	
			Total	**13**	

Grade Thresholds

General Certificate of Secondary Education
Applied Science (Double Award) J649

January 2008 Assessment Series

Unit Threshold Marks

Unit		Maximum Mark	A*	A	B	C	D	E	F	G	U
B481	Raw	50	46	42	38	34	28	22	16	10	0
	UMS	100	90	80	70	60	50	40	30	20	0
B482/1	Raw	60	n/a	n/a	n/a	39	32	25	18	11	0
	UMS	69	n/a	n/a	n/a	60	50	40	30	20	0
B482/2	Raw	60	42	35	28	22	16	13	n/a	n/a	n/a
	UMS	100	90	80	70	60	50	40	n/a	n/a	n/a
B483	Raw	50	47	43	39	35	29	23	17	11	0
	UMS	100	90	80	70	60	50	40	30	20	0

Entry Information

Unit	Total Entry
B481	3275
B482/1	6271
B482/2	1438
B483	378

Specification Aggregation Results

Aggregation was not available for this series.

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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