2009 Science

Standard Grade – Credit

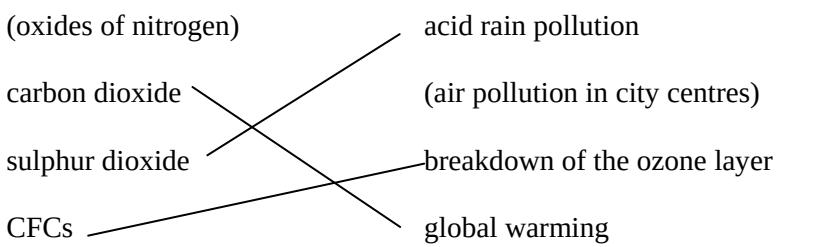
Finalised Marking Instructions

2009 Science − Standard Grade

Credit Level

Marking Scheme

Please note that **FRACTIONAL** marks should **NOT** be awarded for responses to questions on this paper.

				Space for Notes
1	**(a)**	 3 correct 2 marks 1, 2 correct 1 mark	**KU2**	
	(b)	Any one from Scrubbing waste gases or description Use public transport/car sharing/walk/bike/less transport eg cars/ planes Low sulphur fuel/alternative fuels/renewable energy or examples Catalytic converters Correct disposal of refrigerators etc	**KU1**	NOT recycling (unless alternative to burning) planting trees answers related to smoking
2		Turns (the radiator) on when it gets (too) cold **and** Turns (the radiator) off when it gets (too) hot	**KU1**	NOT descriptions of bimetallic strip bending/straightening without reference to switching on/off

				Space for Notes
3	**(a)**	Capillary	**KU1**	Accept thin-walled blood vessel
	(b)	Haemoglobin	**KU1**	
	(c)	**(i)** Tar	**KU1**	
		(ii) Nicotine	**KU1**	
4		Any **two** from Repeat and/or average More/different metal plates Thinner metal or thicker metal plates Drop from greater height or increase the gap or example Heavier punch Sharper punch = more pointed punch Drop punch down a tube More accurate ruler Harder punch New punch for each experiment Any two, 1 mark each	**PS2**	NOT different height different weight different size of punch different metal of punch } * If "different" * given as an extra answer do not penalise. Do it again at a different * … – apply cancelling errors NOT fairness ideas

						Space for Notes
5	**(a)**	**(i)**	Seismic (survey)		**KU1**	
		(ii)	Geological (survey)		**KU1**	
	(b)		B (boiling points)		**KU1**	
6			Polyurethane	1 mark	**KU1**	
			Polyvinylchloride (PVC)	1 mark	**KU1**	
7			Label and scale on y-axis including (%) Legend and labels (or key) on x-axis Bars drawn correctly <u>within</u> ½ small square	1 mark 1 mark 1 mark	**PS3**	Scale must start at zero Accept "min" for "minimum" "max" for "maximum" Superimposed bars okay but <u>not</u> stacked Line graph – max 1 mark for y-axis label, scale + units
8	**(a)**		DDT Aldrin Dieldrin All correct for 1 mark		**PS1**	
	(b)		Idea that: The chemicals <u>accumulate</u> in animals' bodies/body fat		**PS1**	Accept POPs do not break down <u>in the body</u>

			Space for Notes
(c)	Disrupt hormone (production)/hormones Disrupt reproductive processes/reproduction Egg-shell thinning/eggs too fragile to survive Population (almost) wiped out 3 correct, 2 marks 1, 2 correct, 1 mark	**PS2**	NOT reference to individual birds
(d)	Insecticide use was highest/higher/very high/high	**PS1**	

						Space for Notes
9	**(a)**		Any **two** from Tariff, size of house, location, installation charges, standing charges, period of use, cost of other fuels, weather conditions Any two, 1 mark each		**KU2**	NOT appearance answers mentioning insulation 2 answers from same category eg size of house + number of rooms (1 mark) vague answers Standing charges = running costs Weather = location
	(b)	**(i)**	As thickness of (loft) insulation increases, the (annual) heating cost decreases Gas (heating) has lower annual cost (than electric (heating))		**PS2**	
		(ii)	44	2 marks	**PS2**	
			412 – 368	2 correct data selected = 1 mark 1 correct data + correct subtraction = 1 mark } Working must be shown		
10	**(a)**	**(i)**	Packaging		**KU1**	Must use words given
		(ii)	Pesticide treatment		**KU1**	Must use words given
		(iii)	Anodising		**KU1**	Must use words given
	(b)		Electroplating		**KU1**	Must use words given

				Space for Notes
11	**(a)**	B	**KU1**	
	(b)	A	**KU1**	
	(c)	A	**KU1**	
12	**(a)**	less stable fewer links both correct	**KU1**	
	(b)	Any **two** from Movement or description/example Waste Respiration Heat Not eating all the animal Reproduction Growth 1 mark each	**KU2**	NOT breathing sweating
	(c)	**(i)** Increase Nothing to eat them or description	**KU1**	NOT accepting confusion of use of prey and predator
		(ii) No effect Have other food sources or Decrease/slight decrease Less food/fewer food options	**KU1**	NOT decrease because they have NO food

				Space for Notes
13	**(a)**	3 13 **both** required	**KU1**	
	(b)	3	**KU1**	
14	**(a)**	Immunisation	**KU1**	
	(b)	Hypothermia	**KU1**	
	(c)	Anorexia	**KU1**	
15	**(a)**	As (average) wind/speed increases, the (predicted) <u>power</u> (generated) increases	**PS1**	
	(b)	5	**PS1**	
	(c)	Any answer **between** 6.5 and 8.0	**PS1**	

					Space for Notes
16	**(a)**	14.5	2 marks	**PS2**	
		100 – wrong total	1 mark		
		85.5	1 mark		
		100 – 85.5 = wrong answer	1 mark		
	(b)	1.25	2 marks	**PS2**	NOT 50 × 2·5 (0 marks)
		50% of 2.5 = wrong answer	1 mark		
		wrong percentage of 2.5	1 mark		
		$\frac{2 \cdot 5}{2}$ = wrong answer	Working must be shown		
17	**(a)**	Wear resistance Heat resistance	1 mark each	**KU2**	
	(b)	**(i)** Thermal conductivity		**KU1**	
		(ii) Strength		**KU1**	
18	**(a)**	A		**PS1**	
	(b)	2		**PS1**	

							Space for Notes
18	**(c)**	**(i)**	Margaret	B			Accept answers written beside question, not in family tree
		(ii)	Alice	AB		**PS1**	
	(d)	2 (either blood group O or blood group A)				**PS1**	
19	**(a)**	**(i)**	Five pence	(5p)		**PS1**	
		(ii)	Twenty pence	(20p)		**PS1**	
		(iii)	Cupro-nickel			**PS1**	
	(b)	6.65			2 marks	**PS2**	3·45 1 mark (chosen 1p coin)
		$\frac{70}{100} \times 9.5$		correct substitution	1 mark		
		0.7 x 9.5			1 mark		
		1% = 0.095			1 mark		
		10% = 0.95			1 mark		

				Space for Notes
20	**(a)**	y-axis label and unit ‘yield of crop’ **and** unit (kg/Ha) **and** x-axis label and unit ‘concentration of fertiliser’ **and** unit (kg/Ha) 1 mark y-axis linear scale from 100 to 500 **and** x-axis linear scale from 0 to 200 1 mark **allow** transposed axes 4 or 5 points correct for each line **and** lines labelled or a key 1 mark **allow** +/- half box if scale is 1 box/1mm no tolerance if smaller scale is used	**PS3**	
	(b)	As concentration of fertiliser increases, the yield of crop increases Yield of crop A is better than yield of crop B For the same yield, less fertiliser is needed for crop A	**PS2**	
	(c)	Any answer 470 to 480 inclusive (or correct extrapolation from graph)	**PS1**	

					Space for Notes
21	**(a)**	(Right atrium) Left atrium Right ventricle Left ventricle All 3 correct, 2 marks 2 correct, 1 mark		**KU2**	
	(b)	<u>Coronary</u> artery		**KU1**	
	(c)	Idea of: To prevent blood from flowing backwards		**KU1**	
22	**(a)**	**(i)** 6000		**PS1**	
		(ii) 10 carry forward error from (a)(i)		**PS1**	$\frac{5000 \times 12}{\text{answer(a)(i)}} = \text{correct answer}$ 1 mark
	(b)	32 2 marks $\frac{24 \times 8000}{6000}$ 1 mark or any correct substitution with or without rearrangement 1 mark		**PS2**	$24 = \frac{6000 \times S_L}{8000}$ 1 mark
		Totals		**KU 40** **PS 40**	

[END OF MARKING INSTRUCTIONS]