RECOGNISING ACHIEVEMENT

GCSE

Additional Science B

General Certificate of Secondary Education

Unit **B623/01:** Modules B3, C3, P3 (Foundation Tier)

Mark Scheme for June 2012

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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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Annotations used in Scoris

Annotation	Meaning
	Correct response
	Incorrect response
	Benefit of the doubt
	Benefit of the doubt **not** given
	Error carried forward
	Information omitted
	Ignore
	Reject
	Contradiction

Subject-specific Marking Instructions

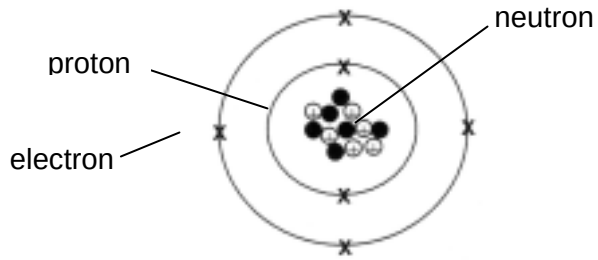
Abbreviations, annotations and conventions used in the detailed Mark Scheme.

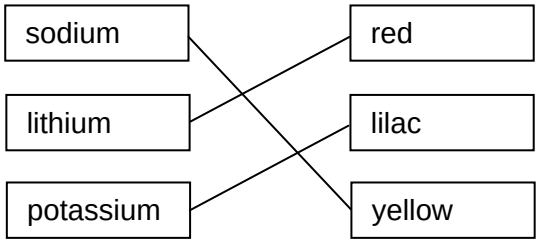
/ = alternative and acceptable answers for the same marking point
(1) = separates marking points
allow = answers that can be accepted
not = answers which are not worthy of credit
reject = answers which are not worthy of credit
ignore = statements which are irrelevant
( ) = words which are not essential to gain credit
__ = underlined words must be present in answer to score a mark (although not correctly spelt unless otherwise stated)
ecf = error carried forward
AW = alternative wording
ora = or reverse argument

Question			Answer	Marks	Guidance
1	(a)		arteries (1)	1	**allow** the heart (1) **allow** named arteries e.g.aorta or coronary artery (1) **ignore** references to veins or capillaries
	(b)		(40 / 100 x 8.5 =) 3.4 (mmol) (1) **but** (8.5 – 3.4 =) 5.1 (mmol) (2) **but** (5.7 – 5.1 =) 0.6 (mmol) (3) **but** 0.6 (mmol per litre of blood) on its own (3)	3	**allow** ecf over the 3 steps **allow** 60 x 8.5 / 100 = 5.1 (2)
		(ii)	DNA (1)	1	**allow** nucleic acid / bases / ACTG (1) **not** chromosomes
	(c)		idea of movement (of a substance or solute) from a high to a low concentration (1)	1	**allow** goes from a high concentration to a low concentration (1) **ignore** breaking down from a high to a low concentration **ignore** references to membranes **not** movement of cells
			Total	**6**	

Question			Answer	Marks	Guidance
2	(a)		**(C)** **B** **A** **D** **E**	2	**all** in correct order (2) **a run of 2** in correct order (1) otherwise (0)
	(b)	(i)	idea of producing different types of cells or specialised cells to do a job (1)	1	**allow** range of cells made (1) **allow** a cell gets given a different job (1) **ignore** cells change **ignore** new cells are made
		(ii)	larger animals have to have longer period (for cell division to produce functional organs) / ORA (1)	1	**ignore** it depends on the size of the animal **ignore** references to complexity or numbers of cells
	(c)	(i)	placenta (1)	1	**ignore** umbilical cord
		(ii)	red (blood) cell (1) haemoglobin (1)	1	**allow** RBC (1)
	(d)		foetus absorbs food from mother's blood / small intestine doesn't digest or absorb or break down food in foetus (1)	1	**allow** gets food from mother's blood (1) **allow** foetus absorbs food from mother or placenta or through umbilical cord (1) **allow** idea that foetus does not need to digest food as mother does it (1) **allow** the small intestine is used to break down food and the baby does not eat before birth (1)
			Total	**7**	

Question			Answer	Marks	Guidance
3	(a)		asexual (1)	1	**ignore** cloning
	(b)		carbon dioxide ☐ food ☐ gravity ✓ oxygen ☐ salt ☐	1	multiple ticks scores 0
	(c)		for growth / to increase in size (1) replacement of worn out / old cells (1) repair to damaged tissue (1)	3	**allow** for cell differentiation (1) **allow** to make new cells or more cells (1) **ignore** mitosis and meiosis **ignore** reproduction
	(d)		modification (1) insert (1)	2	
			Total	**7**	

Question			Answer	Marks	Guidance
4	(a)	(i)		2	all 3 correct – 2 marks 1 or 2 correct – 1 mark **ignore** positive, negative and neutral
		(ii)	12 / twelve (1)	1	
	(b)		gas (1)	1	**allow** vapour (1)
	(c)		silicon / germanium / tin / lead (1)	1	**allow** correct symbol, i.e. Si / Ge / Sn / Pb (1)
			Total	**5**	

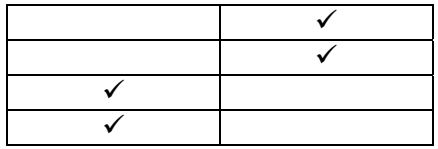
Question			Answer	Marks	Guidance
5	(a)		alkali metals (1)	1	**allow** alkali(s) or alkaline (1)
	(b)		**any two from:** (stops) reaction with air or oxygen / (stops) contact with air or oxygen / sodium reacts with air or oxygen (1) (stops) reaction with water or moisture / (stops) contact with water or moisture / sodium reacts with water or moisture (1) very reactive (1)	2	**allow** reacts with moist air (2) **allow** reacts violently with water / air / oxygen (2) **allow** reacts quickly with water / air / oxygen (2) **ignore** does not react with oil
	(c)		sodium – yellow lithium – red potassium - lilac	2	all 3 correct – 2 marks 1 or 2 correct – 1 mark 
			Total	**5**	

Question			Answers	Marks	Guidance
6	(a)		state of chlorine – gas (1) colour of bromine – red / brown / orange / yellow (1)	2	**allow** any combination of red, brown, orange and yellow e.g. orange-red or red-brown (1) **allow** rusty red or foxy red (1) **not** combinations where one of the colours is incorrect e.g. black-brown **ignore** references to pale or dark
	(b)		making plastics (1)	1	**allow** correct answer ticked, circled or underlined in list if answer line is blank
	(c)		bromine + sodium iodide → iodine + sodium bromide (1)	1	**allow** = instead of → **not** and / & / instead of + **allow** correct formulae (i.e. case and subscripts must be correct) but equation does not need to balance e.g. $Br_2 + NaI \rightarrow I_2 + NaBr$ (1) **allow** mix of correct formulae and words **not** $Br + NaI \rightarrow I + NaBr$
			Total	**4**	

Question			Answer	Marks	Guidance
7	(a)		silver (1)	1	**allow** Ag (1)
	(b)		(£)5400 (1)	1	
	(c)		metals have strong metallic bonds (1)	1	☐ ☐ ☑ ☐
	(d)		electrolysis (1)	1	**allow** correct answer ticked, circled or underlined in list if answer line is blank
	(e)	(i)	4 / four (1)	1	
		(ii)	iron, carbon and oxygen (1)	1	all 3 names required for mark **not** Fe, C and O
			Total	**6**	

Question			Answer	Marks	Guidance
8	(a)	(i)	C (1)	1	more than one letter scores zero. If answer line is blank **allow** correct answer ticked underlined or circled
		(ii)	D (1)	1	more than one letter scores zero. If answer line is blank **allow** correct answer ticked underlined or circled
	(b)	(i)	distance / length (of tunnel) (1)	1	
		(ii)	measuring tape / trundle wheel (1)	1	**allow** or tape measure (1) **allow** metre wheel or measuring wheel (1) **allow** a pedometer (1) **ignore** metre rule **ignore** stopwatch
	(c)		4500 (N) (3) **but if answer incorrect** correct calculation of acceleration as 5(m/s^2) (2) **if incorrect** $\frac{20}{4}$ (1) **or** (force =) calculated acceleration x 900 (1)	3	**allow** ecf for incorrectly calculated acceleration e.g. a = 4/20 = 0.25 then F = 900 x 0.25 = 225 scores 1 **allow** (F =) ma or (force =) mass x acceleration (1) **not** 900 x 20 or 900 x 4
	(d)		area under graph (1)	1	**allow** correct area calculation ½ x 20 x 4 = 40 (1) **allow** multiply the speed by 4 and then half it (1)
			Total	**8**	

Question			Answer	Marks	Guidance
9	(a)		weight (1) downward (force) (1) increasing speed (1)	3	**allow** gravity [1] **not** mass on its own [0] **but allow** the idea of gravity acting on the mass [1] **ignore** gravitational or potential energy **allow** towards the ground (1) **allow** it reaches terminal velocity or terminal speed (1) **ignore** it goes fast
	(b)		kinetic (energy) (1)	1	**allow** KE (1) **allow** movement energy or thermal energy or heat energy (1) **ignore** sound energy
			Total	**4**	

Question			Answer	Marks	Guidance
10	(a)		**distance** travelled from when the brakes are applied (to when the car stops) / AW (1)	1	**must be sure candidate is referring to distance** **not** time **not** how long it takes from when the brakes are applied to when the car stops or how long it takes to brake **allow** how far a car travels after applying the brakes (1)(limit of acceptability)
	(b)		idea that (stopping distance is) braking distance + thinking distance (1)	1	**must be sure candidate is referring to distance** **not** time
	(c)		 (2)	2	**all** correct (2) any two horizontal lines correct (1)
	(d)		**any two from:** brakes (1) airbags (1) seat belts (1) crumple zones (1) collapsing steering column (1) named padded area in car (1)	2	 **ignore** braking **allow** headrest (1) **allow** bumpers or car bonnet (1) **ignore** safety cage
			Total	**6**	

Question			Answer	Marks	Guidance
11	(a)		John (1)	1	If answer line is blank **allow** correct answer ticked, underlined or circled
	(b)		time (1)	1	**allow** how long they work for (1)
			Total	**2**	

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