

Mark Scheme Results

Summer 2016

Pearson Edexcel PLSC
Secondary Science (LSC01) Paper 01
Science Year 9 Achievement

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

SECTION A

Question Number	Answer	Mark
1	C	1
2	B	1
3	C	1
4	D	1
5	C	1
6	C	1
7	B	1
8	A	1
9	C	1
10	D	1

Question	Acceptable answers	Additional guidance	Mark
11(a)	human made/sent by humans (1) that orbits (the Earth/a planet) (1)	Accept: goes/moves around (the Earth/a planet) Ignore above the Earth/in the sky	2
11(b)	Any TWO from <ul style="list-style-type: none"> • weather (forecasting)/climate change (research)/ environmental (research) /pollution (monitoring) (1) • communications (or named example, eg radio, (satellite) television, telephone, internet) (1) • global positioning/GPS/sat nav/mapping (1) • specific military use eg. surveillance/intelligence gathering (1) • exploring space/solar system (1) 	Ignore unqualified military/scientific/research Ignore taking pictures/photographs unqualified	2
		Total for question	4

Question	Acceptable answers	Additional guidance	Mark																		
12(a)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td colspan="2" style="text-align: center;">The forces are</td> </tr> <tr> <td></td> <td style="text-align: center;">balanced</td> <td style="text-align: center;">unbalanced</td> </tr> <tr> <td>The bus changes direction</td> <td></td> <td style="text-align: center;">(✓)</td> </tr> <tr> <td>The bus slows down</td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>The bus is stationary</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>The bus speeds up</td> <td></td> <td style="text-align: center;">✓</td> </tr> </table>		The forces are			balanced	unbalanced	The bus changes direction		(✓)	The bus slows down		✓	The bus is stationary	✓		The bus speeds up		✓	<p>one mark for two correct</p> <p>two marks for all three correct</p> <p>no marks for only one correct</p>	2
	The forces are																				
	balanced	unbalanced																			
The bus changes direction		(✓)																			
The bus slows down		✓																			
The bus is stationary	✓																				
The bus speeds up		✓																			
12(b)	<p>Any two from</p> <p>weight</p> <p>friction</p> <p>air resistance</p>	<p>Ignore mass</p> <p>Accept: drag instead of air resistance</p>	2																		
		Total for question	4																		

Question	Acceptable answers	Additional guidance	Mark
13(a)	insect then fox and hawk	insect must be first Accept: fox and hawk in either order all three needed for one mark	1
13(b)	Any one from: hawk fox	Accept: mouse (omnivore)	1
Total for question			2

Question Number	Answer	Mark
14	C	1
15	D	1
16	A	1
17	D	1
18	D	1
19	D	1
20	C	1
21	D	1
22	C	1
23	A	1

Question	Acceptable answers	Additional guidance	Mark
24(a)	All correct C A D B (2) Most and least correct (1)		2
24(b)	B	Accept the one with no reaction with <u>(both) cold water and steam</u>	1
Total for question			3

Question	Acceptable answers	Additional guidance	Mark
25(a)	Any TWO from <ul style="list-style-type: none"> • (sun)light • minerals/soil type/soil pH • space • temperature/warmth/cold • wind • water/rainfall/humidity • (amount of) carbon dioxide • named pollutant 	Ignore weather/climate/natural disasters unqualified Ignore sun alone Ignore nutrients Ignore soil unqualified Allow heat	2
25(b)(i)	(contains) genetic information /genes/DNA from another/different organism(s) (1)	Accept reference to genetic information/genes/DNA from a different named organism Ignore genes changed unqualified	1
25(b)(ii)	Any ONE from <ul style="list-style-type: none"> • improve shelf life • disease/insect resistance • resistance to weedkiller/herbicide • increase yield/vitamin content (of crops/fruit) • change appearance/height/colour/new trait OWTTE 	Ignore live longer/grow faster unqualified	1
25(b)(iii)	Any ONE from <ul style="list-style-type: none"> • idea of unknown possible/future health effects • genes being passed on (to other organisms) • (may feel they) don't have enough information about them 	Ignore might be dangerous/harmful unqualified Reject poisonous Ignore speculative health effect eg it causes cancer	1
Total for question			5

Question	Acceptable answers	Additional guidance	Mark
26	0.25 (2) Working mark either for (0.5 x 0.2) or 0.1 (in numerator) OR 0.4 in denominator is 1 mark	Award both marks for correct answer with/without working Accept 25 <u>cm</u> for TWO marks Full working is $0.5 \times 0.2 = 0.25$ 0.4	2
		Total for question	2

Question Number	Answer	Mark
27	A	1
28	C	1
29	B	1
30	C	1
31	A	1
32	A	1
33	A	1
34	D	1
35	B	1
36	B	1

Question	Acceptable answers	Additional guidance	Mark
37(a)	Any ONE from <ul style="list-style-type: none"> • acid rain • damage to trees/plants/statues • breathing/respiratory problems • acidifies lakes/kills fish 	Ignore pollution Ignore greenhouse effect/climate change/global warming	1
37(b) (i)	None/clean air/ <u>no</u> air pollution (1)	Reject little pollution	1
37(b) (ii)	<u>indicator</u>	Ignore monitor organisms	1
		Total for question	3

Question	Acceptable answers	Additional guidance	Mark
38(a)	magnesium (1) sulfate (1)	Accept sulphate hydrogensulfate(1)	2
38(b)	Mg (1)+ 2(1) HCl → MgCl ₂ + H ₂	Do not allow MG for first mark but can then score balancing mark	2
Total for question			4

Question	Acceptable answers	Additional guidance	Mark
39	Any three from <ul style="list-style-type: none"> • M1 choose/select horses/parents/males/females that can run fast • M2 reproduce/breed/mate/artificial insemination • M3 choose best/fastest offspring • M4 process is repeated over several generations 	Ignore all references to cloning need idea of choosing <u>and</u> fast for this mark need idea of choosing <u>and</u> offspring/foals OWTTE for this mark	3
Total for question			3

SECTION B

Question	Acceptable answers	Additional guidance	Mark
40(a)(i)	fair test (1)	Accept: so can make (valid) comparison OWTTE Ignore references to bias Reject makes it reliable	1
40(a)(ii)	Any ONE from: <ul style="list-style-type: none"> • same size beaker/container • same material/insulation for beaker • both have lids or not • specific environmental condition eg same room temperature/same air movement 	Ignore same starting temperature/ same volume/ same drink (all given) Ignore same beaker unqualified and same room/place unqualified	1
40(b)(i)	correct plotting of all seven points (2)	Tolerance within <u>less than</u> half a square -1 for each plotting error (maximum deduction 2 marks)	2
40(b)(ii)	58 (°C) (1) doesn't fit the pattern/trend/curve/it is too high /OWTTE (1)	Accept: correct point circled on graph Allow 20 minutes Explanation dependent on correct answer 58 Ignore wrong place unqualified Ignore predicted values	2
40(b)(iii)	Points joined using a smooth curve and ignoring anomaly (1)		

40(c)	Any ONE from: <ul style="list-style-type: none"> • different size beakers/containers • different materials/insulation for beakers • only one had lids • specific environmental condition eg different room temperature/different air movement 	Accept: <u>systematic</u> error in thermometer reading Ignore started at different times	1
40(d) (i)	160 (1)	Unit not required	1
40(d) (ii)	Any ONE from: needs more divisions/graduations designed to measure (much) higher temperatures	Ignore scale is too large/small unqualified Allow: It <u>only</u> goes up in five degree intervals Allow: reverse argument eg It should have a maximum of 100 OWTTE	1
Total for question			10

Question	Acceptable answers	Additional guidance	Mark
41 (a)	Any ONE from <ul style="list-style-type: none"> • stop clock/watch/timer • ruler 	Accept: measuring tape	1
41 (b)	burns/named item catching fire/touching hot object metal rod	Ignore smoke/smell	1
41 (c)	Any TWO from <ul style="list-style-type: none"> • (same) size of flame • heat at same place (on rod) • candle same distance from heated end of rod • (same)length/width/diameter/shape of rod 	Ignore references to room temperature Ignore size of bar unqualified	2
41 (d) (i)	<ul style="list-style-type: none"> • metal/type of metal rod/material (rod) is made from 		1
41 (d) (ii)	<ul style="list-style-type: none"> • time (for the candle to fall off) 		1
41 (e)	<ul style="list-style-type: none"> • repeat (his experiment) 	Ignore references to accuracy	1
41 (f) (i)	<ul style="list-style-type: none"> • aluminium 		1
41 (f) (ii)	<ul style="list-style-type: none"> • (stainless) steel (1) • It had the lowest conductivity/OWTTE (1) 	Ignore does not allow heat to pass through Allow reverse argument eg other metals conduct better than steel second mark dependent on steel	2
		Total for question	10

