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Mark Scheme (Results)
November 2009

GCSE

360Science

GCSE Additional Science
Structured Paper P2 (5020F/1F)

GCSE Physics
Structured Paper P2 (5048F/1F)

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Using the Mark Scheme

1. This mark scheme gives you;
   * an idea of the type of response expected
   * how individual marks are to be awarded
   * the total mark for each question
   * examples of responses that should not receive credit.

2. ; separates points for the award of each mark.

3. / means that the responses are **alternatives** and either answer should receive full credit.

4. ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.

5. Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.

6. OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.

7. 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.

8. 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.

9. ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.

10. ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

Marking

1. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.

2. **Do not** award marks for repetition of the stem of the question.

3. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

Amplification

1. In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.

2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.

3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.

4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1(i)	displacement ;	Recognisable mis-spellings e.g. displacment	distance	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1(ii)	velocity ;	Recognisable mis-spellings e.g. velosity	vector	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1(iii)	size; direction;	any order **FOR 1 MARK** ACCEPT THE FOLLOWING PAIRS OF WORDS IN *EITHER* ORDER: Acceleration + velocity Acceleration + displacement Velocity + displacement		**(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2(a)	1. negative particles have left the comb ; 2. negatively charged ; 3. electrons ;			**(1)** **(1)** **(1)**

Question Number	Correct Answer	Acceptable Answers	ignore	Reject	Mark
2(b)	similar charges repel ;	• (all) hair positive so repel • (all) hair negative so repel • Correct statement about forces between charges e.g. positive comb attracts negative hair	Repeat of stem or ORA of part (a) "Unlike charges attract" without reference to comb and hair		**(1)**

Question Number	Correct Answer	Acceptable Answers	Ignore	Reject	Mark
2(c)	electrons have moved (off the hair) ;	*Idea of charge movement e.g.* It's lost its charge Its been discharged Charge(s) spreads out (over him) Goes to earth He is earthed It conducts away Charge is neutralised Metals conduct charge	Neutrons Protons Repeat of stem		**(1)**

Question Number	Correct Answer	Mark
3	I mark for each;;; -1 for each additional answer (all 6 statements ticked = 0)	**(3)**

statement	**tick?**
No risk to the public	
No carbon dioxide is produced	✓
No problems with the waste	
No fossil fuels are used	✓
No thermal energy is wasted	
No atmospheric pollution	✓

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4(a)(i)	Any **two** from comment re stopping distance • 12 m is stopping distance for 9 m/s ; • his (at 27 m/s) stopping dist is/should be 73 m ; • he would not he able to stop in time ; comment re thinking distance • 12 m is less than the thinking distance of 18 m ; • 12 m is the thinking distance for 18 m/s; • 12m does not allow enough thinking time; • comparison/statement that 12 m is too short; • he would not he able to stop in time ;	This distance is for 9 m/s quoting both 18 m and 55 m for 27 m/s he is going too fast he could have a crash; He is too close **1 max for answers which do not use data from the graph**	repeat of stem	**(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4(a)(ii)	suitable value (extraction of data from chart); suitable and sensible explanation *linked to* number quoted ;	73 (18+55) 18 (thinking @ 27m/s) ecf numerical distance from ai e.g. • (18) he must keep at least his thinking distance apart / gives him (more) time to think • (73) is the stopping distance **allow for 2 marks one of** • 54 is the two second rule (must have number and explanation) • a number between15-30 linked to 6(8) car lengths (must have number and explanation)	(55) braking distance	**(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4(b)(i)	thinking time ;			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4(b)(ii)	27 m/s ;			**(1)**

Question Number	Correct Answer	Mark
5(a)		**(3)**

	what it is	**charge**	**ionising ability**	**stopped by**
alpha	helium nucleus	**positive/ plus / 2/ +2 +(1)/+ve/+2(e)**	strongest	paper
beta	**(an) electron/ (high energy/fast moving) electron(s)/**	negative	medium	a few mm of aluminium
gamma	electromagnetic wave	**Neutral/ none/ zero/ 0 / no charge/ nil/ "N/A" / "n/a" ignore " - "**	weakest	thick lead

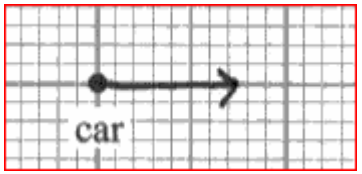
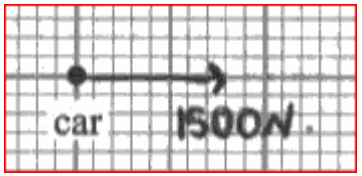
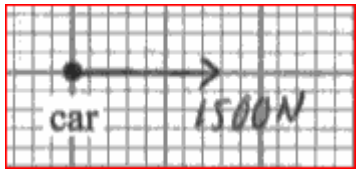
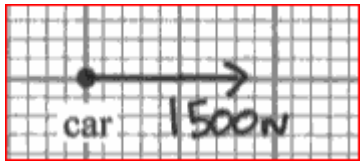
1 mark for each correct box ;;;
accept positive as **+** or **+ve**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
5(b)	27 ; 33 ;			**(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
6(a)	substitution; answer;	23 × 50 1150	incorrect unit if seen for 1 mark but accept Nm	**(2)**

Question Number	Correct Answer		Acceptable Answers	Reject	Mark
6(b)	substitution; answer; unit;	allow ecf from a 1150 / 28 41.07 watts / W / J/s / Nm/s	41 / 41.1 / 41.0714 etc Watts ignore P	42 Js	**(3)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
7(a)	1500 N	5000 -3500		**(1)**

	Correct Answer	Acceptable Answers		Reject	Mark
7 (b)	1. force arrow to right with arrow head starting at centre line; 2. size of arrow to be 1500 N in scale given; check for ecfs tolerance is +/- ½ small sq	**BOTH** needed for the mark  no need to label with 1500N  in tolerance correct length line with arrow on left of car	 in tolerance  out of tolerance	• lack of arrow head • incorrect direction • 2 arrows	**(1)**

TOTAL MARK 30

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