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Mark Scheme (Results)
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GCSE

360Science

GCSE Additional Science P2 (5020F/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.

Q no.	answer	allow	ignore	reject	mark
1a	any **two** from • low friction (between road surface and tyres)/ slippery • unable to produce turning force/OWTTE • (tyres) can't grip the road • stopping distance increased		can't control the car		2
1b	Any two sensible;; e.g. airbag/air cushion crumple zone seat belt	side impact bar a.b.s.	reference to speed		2
2a	**electrons;**	recognisable spellings			1
	positive;	recognisable spellings			1
	repelled;	recognisable spellings			1
	like OR positive;	recognisable spellings (the) same (type of)			1
	forces;	recognisable spellings			1
2bi	Any two from: • static /charge • caused by friction • Phillip is earthed/ORA • car is <u>charged</u> • discharged through Phillip;;				2

2bii	any one from • charges 'leak' in damp weather/ORA • more charge when warm and dry • less charge when raining;				1
3ai	Any two from: • n hits U (nucleus) • U (nucleus) becomes unstable • U (nucleus) splits • 2 daughter products • extra n released • energy released;;	high speed of particles	fission fragments		2
3aii	**kinetic (energy);**	movement (energy) recognisable spellings	thermal /(heat)		1
3b	fuel rods remain radioactive for a long time after use; fuel rods could be used to help make nuclear weapons; 1 correct tick = 1mark 2 correct ticks = 2marks 1 correct and 1 incorrect =1 mark 2 correct and 1 incorrect = 1 mark 2 or 3 incorrect = 0 marks				2
4ai	(gravitational) **potential** energy reduced/transferred/changed; kinetic energy;	stored for potential movement energy for kinetic			2

4aii	any **two** from requirement for energy to gain ht idea of energy loss where energy is lost;;				2
4b	Work done equals electrical energy spent / V× I ×t; 600 x 25 x 180 OR 2 700 000 /2.7MJ / 2 700 KJ; mark from bottom up	bald correct ans = 2 marks			2
5a	**more than one tick per horizontal row negates that row** most penetrating – gamma least penetrating – alpha most ionising – alpha least ionising – gamma **Any *one* correct row; (1 mark)** **All 4 rows correct;;**				2
5b	gamma most penetrating/greatest range;	least ionising so safer			1
5c	protons =27 electrons = 27 neutrons = 33 **Any *one* correct; (1 mark)** **All 3 correct;;**				2
5d	(performance) cobalt penetration OR time to scan;			x-rays	1

5d	(safety) cobalt faster;	X ray lower energy	references to penetration		1