

Mark Scheme (Results) Summer 2007

GCSE

GCSE Science B (2P/5647, 2P/5667, 5P/5648,
5P/5668)

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. You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The total mark awarded for a question should be written in the box at the end of the question.
2. The total marks for a question should then transferred to the front of the script.
3. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
4. **Do not** award marks for repetition of the stem of the question.
5. 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 bold, 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.

QUALITY OF WRITTEN COMMUNICATION

Students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use of a suitable structure and style of writing.
- use ✓c or Xc to show if the communication mark is given or not.

Mark Scheme

If there are two question numbers, the first refers to the Foundation tier paper and the second to the Higher tier paper.

1 a

prediction	Correct (✓)
the car will get faster...	✓
when the angle is bigger...	
when the car is heavier...	✓(given)
polishing the slope makes...	
if distance A to B is large...	✓

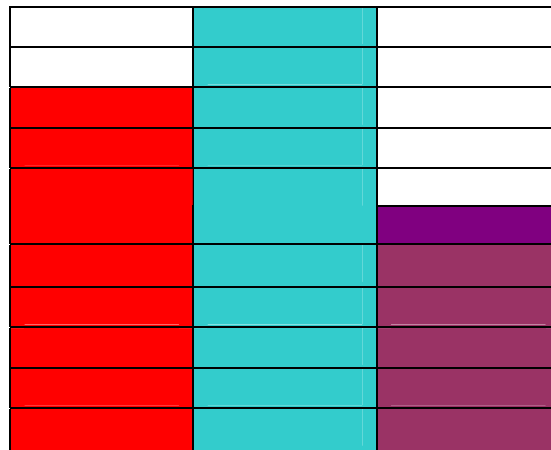
2

b i

material	speed at A (m/s)	speed at B (m/s)	increase (m/s)
none			1.1
aluminium foil			
plastic sheet			
sandpaper			

1

ii



All 3 correct;;
Any two correct;

2

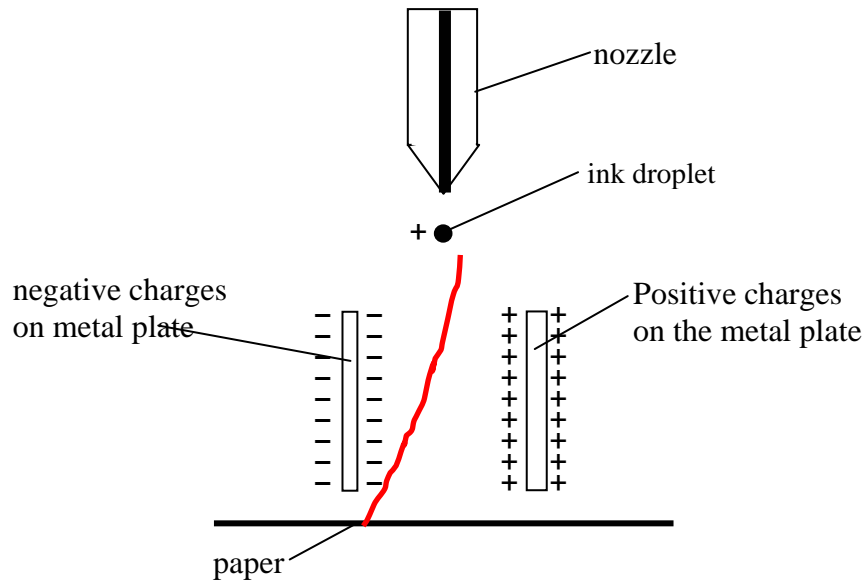
iii plastic sheet;
gravity;
accelerate;

3

Total 8 marks

2 a i

1



clear path or line of dots as shown towards the left [attracted to negative plate];

it must not move towards the positive plate at all
arrow not necessary but must be correct if given

ii like charges **repel** or opposite/unlike charges **attract**;
reject reference to magnets or poles

1

b

any 2 from

improved quality of finish/no streaks or runs/OR

faster/more efficient [easier is insufficient]/OR

less mess/drips [on floor] /OR

better coverage/doesn't miss any bits/OR

more economical/uses less paint [ignore bald 'cheaper'] /OR

2

any other sensible suggestion;;

ignore 'it sticks better'

Total 4 marks

3

2

change	makes motor turn faster
use stronger magnets	✓
change the poles N and S around	
have fewer turns on the coil	
move the magnets further apart	
increase the current	✓

Total 2 marks

4/1	a	i	<u>core</u> or <u>yoke</u> ;	1
		ii	(soft) iron; allow 'Fe' but not FE or fe or fE	1
	b	i	[it] increases the voltage [not volts]; accept steps up the voltage reject increasing power/energy/current or adding voltage ignore reference to reducing current/ reducing power losses/ reducing energy losses	1
		ii	reduces current level; reduces E losses/power losses/more efficient; [allow 'heat' for energy] ignore safer/cheaper <i>candidate can not score the first mark if they refer to the current or voltage changing speed</i> communication: presents relevant information in a form that suits its purpose	2
	c		any TWO sensible suggestions;	1
			noise eyesore/ugly loss of value of house interference with electrical appliances distrust [of scientists]/public may not believe scientists perception of other health risks (not cancer) specific safety concern;; or ONE suggestion and further relevant detail;; e.g. noise and therefore would get headache etc during heavy weather power lines could collapse and cause damage	2

Total 8 marks

5/ 2	a	1200 N in opposite/ backwards/to the left direction. allow an arrow to the left, or W or NW	1
	b	work done = force x distance; = 1200 x 12; = 14400 ; J (allow Nm);	equation not triangle, allow formula substitution answer energy unit

Total 5 marks

6	acceleration = $\frac{\text{change of speed}}{\text{time}}$; $a = (-)0.71 \text{ (m/s}^2 \text{)}$ [range 0.7-0.75]; negative sign or statement;	equation or a $\frac{\text{change in speed}}{\text{time}}$ in figures e.g. 50/70 or equivalent or correct units answer allow working shown on graph	3
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Total 3 marks

- 3 a acceleration = $\frac{\text{change of speed}}{\text{time}}$; equation or a $\frac{\text{change in speed}}{\text{time}}$ **3**
in figures
e.g. 50/70 or equivalent or correct
units
answer
a = (-)0.71 (m/s²)
[range 0.7-0.75];
negative sign or statement; allow working shown on graph
- b distance = area under graph or distance = speed X time; equation *allow trapezium rule* **3**
= 20 x 50 + $\frac{1}{2}$ x 70 x 50; substitution
=2750 (m) answer
[range 2700-2800];
units if given must be correct

Total 6 marks

- 4 a any 2 from **2**
electrons/negative charge move
from comb / onto hair
(due to) friction;;
reject for the first two marking points ions or positive electrons
- b earthed /electrons (or charge) moved onto the tap/she is discharged; **1**
[*she is no longer charged is insufficient*]
reject ions or positive electrons
- c (induced)negatively charged (side of) rice attracted by positive/comb; **1**
reject reference to magnets

Total 4 marks

- 5 a i **time** for half of the **atoms** to **decay**/ **time** for the **activity** to drop to half (of original value); **1**
 accept isotope/element/nuclei/radioactive substance for atoms
 do not accept ion(s)/atom/reactivity
 do not accept decompose/die/lose for decay
- ii 24 days accept three half lives or 3 x 8 **1**
- b i any two from **2**
must have reason and consequence----no vague 'it's stronger, harmful'
 Ra has long half life so difficult to dispose/**ORA**
 Ra emits α so radiation will not reach tumour/Co emits β and γ so can be used externally
 α is highly ionising and so damages cells more/**ORA**
- ii *all three ideas are needed for the mark* **1**
 idea of time
 idea of reduced activity
 idea of minimal damage (to health);
 e.g. faster decay causes least damage scores the mark
- iii (technetium/cobalt/palladium) emits γ so it can be detected outside the body; **1**
 technetium/lutetium has (short) half life appropriate for the job; **1**
- Total 7 marks**

TOTAL FOR PAPER: 30 MARKS