

GCSE

Science: Single Award B (1535)

Science: Double Award B (1536)

Separate Sciences: Biology B (1529),
Chemistry B (1539), Physics B (1549)

Summer 2005

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Mark Scheme (Results)

1P/5657

1P/5647

4P/5658

4P/5648

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 be 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

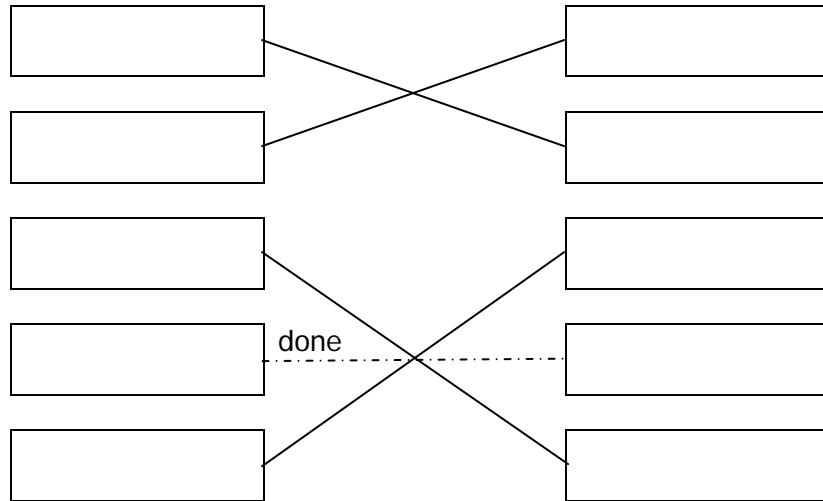
Students will be assessed on their ability to:

- 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 one mark for each correct line 4



Total 4 marks

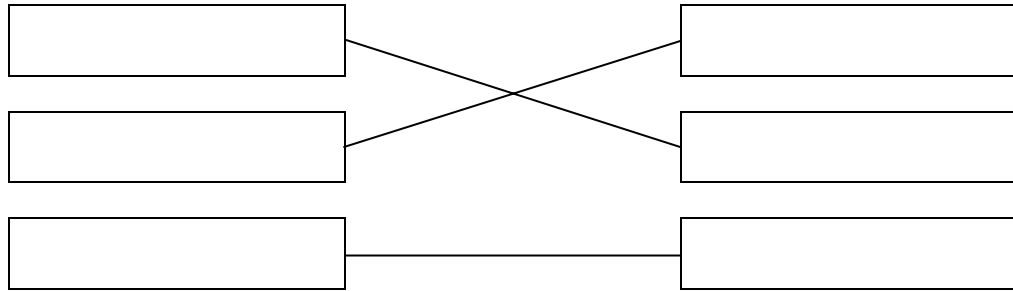
- 2
- | | | | |
|----|-----|--|---|
| a) | i) | gravity; | 1 |
| | ii) | gravity; | 1 |
| b) | | big bang/steady state/continuous state/oscillating/Hoyle; | 1 |
| c) | i) | line continuing with positive/zero gradient from A (ignore prior to A) | 1 |
| | ii) | mass; | 1 |

Total 5 marks

- 3
- | | | | |
|----|-----|---|---|
| a) | | 3 x 0.5 x 8; substitution | |
| | | 12 (any unit is neutral); | 2 |
| b) | | Any two points from:
pattern from table;
shock at low level (current)/less than 5 A;
current is too small to melt/blow/break fuse/OWTTE; | 2 |
| c) | i) | protects against wires/motor/circuit (not person) catching fire;
fault/large current breaks circuit/OWTTE; | 2 |
| | ii) | double insulation (eg rubber handles or plastic casing)/(RC)CB/circuit breaker/OWTTE; | 1 |

Total 7 marks

4/1 a) one mark for each correct line;; (any 1 or 2 correct lines;) 2



b) alpha; (ignore beta reject gamma for both marks) highly ionising/does not penetrate far/short range/absorbed easily; 2

Total 4 marks

5/2 a) i) frequency/pitch too/very high or above hearing range/greater than 20 000Hz; (NOT deaf: ignore biology: reject lists including loud, but allow for example "even though it is loud") 1
 ii) reflection (ignore echo/bouncing); to be received/detected or comes back to device; 2
 b) (ultrasonic) scan/kidney/gall stone treatment/cleaning utensils/dental treatment/cleaning earwax/detecting tumours (not brain scan); 1
 safety or less damage/harmful/chance of cancer/OWTTE; 1
 (any valid use and reason can score 2 marks)
 (imaging soft tissue can score once in either place)
 QWC (suitable style and structure {ignore spelling/text}); 1

Total 6 marks

6/4 a) magnet; 1
 b) any one from:
 more turns/wires on coil or more coils/tighter coils;
 turn faster;
 stronger/more powerful magnet (ignore bigger);
 pedal faster;
 increase speed of bicycle;
 turn X faster; 1
 c) advantages:
 no cost of buying new batteries/save limited resources/batteries thrown away/cheaper to run/renewable(ignore environmentally friendly/saves energy/electricity); 1
 disadvantages:
 lights go out when wheel slows/harder to pedal/brightness is speed dependent/dearer to buy OWTTE; 1

Total 4 marks

3 a) i) resistance increases; 1
 ii) ($R = V/I$ or $V = IR$); equation (not triangle)
 6/0.01; substitution
 600 (Ω); ans (ignore unit) 3
 b) line of negative slope [starts at 0.01 (A)]; 1

Total 5 marks

- 5 a) i) any two from:
 (quantified) large current;
 breaks circuit/fuse melts/blows;
 (current) greater than fuse rating; 2
- ii) any two from:
 detect current differences in the live and neutral wires;
 act quickly;
 act at any current value; 2
- b) EITHER
 act very quickly/in 0.02 s OR 30 mA is in harmful range/less than 100 mA;
 therefore (harmful but) probably not fatal (dependent);
 OR
 it is not very effective;
 because the current is in harmful range/above 10 mA; (dependent) 2

Total 6 marks

- 6 a) light emitted from star is nearer the red end of the spectrum compared
 to that expected/wavelength stretched idea (or frequency reduced);
 star moving away (from observer)/similar to Doppler effect; 2
- b) microwaves/background cosmic/electromagnetic (not gamma or X)
 radiation is detected/left over; 1
- c) light from one edge - red shift;
 light from other edge - blue shift/less red shift; (on diagram or written) 2

Total 5 marks

TOTAL FOR PAPER 30 MARKS