OCR
RECOGNISING ACHIEVEMENT

GCSE

# Additional Science A

General Certificate of Secondary Education **A218-01**

Unit 4: Ideas in Context (Foundation Tier)

# Mark Scheme for June 2010

Oxford Cambridge and RSA Examinations

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| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 1 | a | | analogue [old] signals not being transmitted / only digital [new] signals are being transmitted / any reference to switchover (1) | [1] | **accept** 'changing to digital'<br><br>**ignore** reference to regions |
| | b | | analogue – any continuously varying wave or set of waves (1)<br><br>digital – any attempt at a square wave (1) | [2] | example diagram<br><br>analogue digital<br>  <br>original signal original signal<br><br>if the diagrams are 'correct', but the wrong way round, no marks<br><br>**accept** non-constant in amplitude and/or frequency in either wave<br><br>**ignore** reference to '1's and '0's<br>**ignore** diagrams showing wave fronts<br>**ignore** diagrams showing coils |
| | c | | noise (1)<br>quality (1)<br>pattern (1)<br>amplified (1) | [4] | **allow** 'quality' for third space |
| | d | | 660 x 0.5 (1)<br>330 (1) | [2] | correct numerical answer gains both marks<br>**no** ECF<br>**allow** 660/2 as alternative to 660 X 0.5 |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 1 | e | i | not <u>absorbed</u> (by atmosphere) (1) | [1] | **reject** not absorbed by ionosphere<br>**accept** can reflect off <u>ionosphere</u> |
| | | ii | microwaves (1)<br><br>can go through <u>ionosphere</u> /<br>radio waves cannot go through <u>ionosphere</u> (1) | [2] | **mark independently**<br><br>**accept** microwaves not stopped / not absorbed / not blocked / not prevented / not reflected / ORA<br>**accept** ionosphere prevents transmission (of radio waves)<br>**ignore** atmosphere<br>**ignore** references to speed |
| | | iii | idea of reflection (1) | [1] | **ignore** conduction |
| | | | **Total** | [13] | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 2 | a | i | 668 000/ 80 (1)<br>8350 (1) | [2] | correct numerical answer gains both marks<br>no ecf<br>**accept** different ways of writing the working eg<br>668 000 x 1/80<br>668 000 x 0.0125<br>do **not** credit working if it is only one stage of a longer, incorrect calculation |
| | b | i | nucleus / chromosomes / DNA (1) | [1] | |
| | | ii | 4 (1) | [1] | **accept** 'GCAT' |
| | | iii | proteins (1)<br>inactive (1) | [2] | responses must be in the correct order |
| | c | | **any two from:**<br>any reference to cloning;<br>any therapeutic context;<br>any reference to <u>making</u> tissue/cells/organs; | [2] | look for a **use** of stem cells, not just a description<br><br>therapeutic – any reference to medical intervention (apart from IVF) eg 'treating patients'<br>'replace/repair tissues' = 1 mark for therapeutic, but has not told us that tissues are being <u>made</u>, only used for replacement, so **not** the second mark<br>**ignore** 'to do research'<br>if part of the answer is in terms of plants, do **not** give credit for that part but treat as neutral |

<table>
<tr><th colspan="3">Question</th><th>Expected Answers</th><th>Marks</th><th>Additional Guidance</th></tr>
<tr><td>2</td><td>d</td><td>i</td><td>
<table>
<tr><th>stage</th><th>only mitosis</th><th>only meiosis</th><th>neither</th></tr>
<tr><td>1 Fertility drugs …</td><td></td><td>✓</td><td></td></tr>
<tr><td>2 Egg cells are …</td><td></td><td></td><td>✓</td></tr>
<tr><td>3 Sperm … incubated …</td><td></td><td></td><td>✓</td></tr>
<tr><td>4 A sperm … ... fertilises …</td><td></td><td></td><td>✓</td></tr>
<tr><td>5 … egg (zygote) …</td><td>✓</td><td></td><td></td></tr>
<tr><td>6 …embryo is placed …</td><td></td><td></td><td>✓</td></tr>
</table>
</td><td>[2]</td><td>correct mitosis column = 1 mark<br>correct meiosis column = 1 mark<br>ignore third column</td></tr>
<tr><td></td><td></td><td>ii</td><td>similarity:<br>(egg and) sperm / gametes involved (1)<br><br>difference:<br>(IVF) happens in Petri dish / outside the body / does not involve intercourse (1)</td><td>[2]</td><td>ignore ‘both form a zygote’<br><br>ORA<br>ignore ‘is not natural’</td></tr>
<tr><td></td><td></td><td>iii</td><td>46 (1)</td><td>[1]</td><td>accept ‘23 pairs’</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>[13]</td><td></td></tr>
</table>

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 3 | a | | nitric (acid) (1)<br>hydrochloric (acid) (1) | [2] | |
| | b | | carbon dioxide (1) | [1] | if more than one chemical named, no marks<br>**ignore** formula [given in the paper] |
| | c | i | goes down (1) | [1] | something about direction of change needed<br>**ignore** any numbers except for the candidate who does not give direction of change, but does quote the correct start and end masses, eg 'the mass goes from 201 to 200.25' |
| | | ii | carbon dioxide is given off / a gas is given off (1) | [1] | **ignore** evaporation arguments<br>**ignore** explanations of change in rate |
| | | iii | 60 seconds / 1 minute (1) | [1] | **allow** 59 seconds<br>**allow** '60' without units<br>**accept** 'A further 30 seconds' |
| | | iv | higher temperature /<br>higher concentration of acid /<br>grind up the solid / smaller lumps / bigger surface area /<br>agitate the solution / shake it / stir it (1) | [1] | **ignore** change in amount of any reagent<br>**allow** 'use stronger acid'<br>**accept** 'less dilute' for 'more concentrated'<br>**allow** use a catalyst |
| | d | i | not safe (1) | [1] | **accept** 'hazard' or 'explosive' but **not** 'flammable' or 'violent'<br>**ignore** references to increased rate of reaction – the candidate must specifically discuss safety. |

| Question | | | Expected Answers | Marks | Additional Guidance |
|---|---|---|---|---|---|
| 3 | d | ii | titrate [metal hydroxide with acid] (1) | [1] | **accept** words such as 'titre'<br>**allow** specified flow chart route eg 'no then yes' or 'yes, no, yes' |
| | e | | **first mark:**<br>copper oxide / copper carbonate (1) | [4] | <br>**reject** copper<br>**accept** - copper hydroxide<br>if more than one substance is suggested, all must be correct to score<br>**ignore** – metal oxide, hydroxide, carbonate |
| | | | **any three marks from:**<br>add excess (solid) / too much (solid) idea;<br><br>when reaction stops;<br><br>filter off (the solid);<br><br>evaporate/ leave to crystallise;<br><br>dry in an oven/desiccator/ dry with paper;<br><br>QWC: one mark for correct spelling, punctuation and grammar in the first two lines | <br><br><br><br><br><br><br><br><br><br>[1] | <br>**ignore** references to excess acid<br><br>'after the experiment' not enough<br><br>**allow** filter in context of either excess solid or crystals formed<br><br>**allow** any idea of time taken for crystals to form<br><br>**ignore** any references to 'heating' alone<br><br>max one mistake in the first 2 lines - ignore words of more than two syllables<br>must have at least two lines to score QWC |
| | | | **Total** | [14] | |

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