<table>
<tr><th>Question Number</th><th>Scheme</th><th>Marks</th></tr>
<tr><td>3.(a)</td><td>
<table>
<tr><th>N</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>4217</td><td>421.7</td><td>421</td><td>4210</td><td>7</td></tr>
<tr><td>421</td><td>42.1</td><td>42</td><td>420</td><td>1</td></tr>
<tr><td>42</td><td>4.2</td><td>4</td><td>40</td><td>2</td></tr>
<tr><td>4</td><td>0.4</td><td>0</td><td>0</td><td>4</td></tr>
<tr><td>0</td><td></td><td></td><td></td><td></td></tr>
</table>
Output values: 7, 1, 2, 4
</td><td>M1
A1
A1
A1
(4)</td></tr>
<tr><td>(b)</td><td>The first value is the units digit of N, the second value is the tens digit, the third is the hundreds digit, and so on</td><td>B2, 1, 0
(2)</td></tr>
<tr><td></td><td></td><td>6 marks</td></tr>
</table>

Notes for Question 3

a1M1: At least three rows of cells completed with a correct first row – condone repeated values in all columns or a single value in each row
a1A1: CAO – the values in the second and third row correct
a2A1: CAO – fourth row correct and a zero only in the fifth *N* row
a3A1: Correct outputs (7, 1, 2, 4) – dependent on the first **four** rows being correct – the output must either be stated on the given answer line or 'output 7, 1, 2, 4' must be clearly written somewhere near the table (do not bod column D being circled, etc.). Condone the output being stated as 7124

b1B1: Indication that the outputs are the digits of *N*
b2B1: Indication that the digits are in the reverse order

Examples of **B1 B1**:
- The output is *N* (**or** the original input **or** 4217) in reverse order
- The output is *N* backwards
- The output is (the digits of) *N* written right to left
- The first value is the unit digit of *N*, the second value is the tens digit, and so on

Examples for **B1 B0**:
- The output is each number of *N*
- The output is *N*
- Output values are the values that make up the original input

Examples for **B0 B0**:
- The output comes from/is derived from the original input
- The algorithm removes the last digit step by step
- The output values are the last digits of *N*
- The output is the last digit of *N*
- The output is *N* + contradictory statement (e.g. 'output is *N* or a number that is smaller than *N*')

Example for **B0 B1** (not common):
- The output is in reverse/right to left/backwards (so no mention of *N* **or** original input **or** 4217)

<table>
<tr><th>Question Number</th><th>Scheme</th><th>Marks</th></tr>
<tr><td>5. (a)</td><td>
<table>
<tr><td>x</td><td>y</td><td>t</td><td>Is x odd?</td><td>Is x = 0?</td><td></td></tr>
<tr><td>27</td><td>5</td><td>0</td><td>Yes</td><td></td><td></td></tr>
<tr><td>26</td><td>(5)</td><td>5</td><td></td><td>No</td><td>Row 1</td></tr>
<tr><td>13</td><td>10</td><td>(5)</td><td>Yes</td><td></td><td>Row 2</td></tr>
<tr><td>12</td><td>(10)</td><td>15</td><td></td><td>No</td><td>Row 3</td></tr>
<tr><td>6</td><td>20</td><td>(15)</td><td>No</td><td>No</td><td>Row 4</td></tr>
<tr><td>3</td><td>40</td><td>(15)</td><td>Yes</td><td></td><td>Row 5</td></tr>
<tr><td>2</td><td>(40)</td><td>55</td><td></td><td>No</td><td>Row 6</td></tr>
<tr><td>1</td><td>80</td><td>(55)</td><td>Yes</td><td></td><td></td></tr>
<tr><td>0</td><td>(80)</td><td>135</td><td></td><td>Yes</td><td></td></tr>
<tr><td></td><td></td><td>(135)</td><td></td><td></td><td></td></tr>
</table>
Output = 135
</td><td>M1 (3 rows + 1st correct)

A1 (2nd and 3rd rows correct)

A1 (4th, 5th and 6th rows correct)

A1 (CSO) (4)</td></tr>
<tr><td>(b)(i)
(ii)</td><td>x must be a (positive) integer and therefore x = 122

61</td><td>B1 DB1
B1 (3)
7 marks</td></tr>
<tr><td colspan="3">Notes for Question 5</td></tr>
<tr><td colspan="3">Candidates may write each changed value/statement in a new row which is fine. Assume that each row begins and ends when a value in x is changed. For example, the values in row 1 in the table above consists of the x values going from the 26 to the 13

a1M1: At least three rows of cells in columns x, y and t completed with a correct first row (so 26 for x and 5 for t)
a1A1: CAO – second and third rows correct (for just the columns in x, y and t)
a2A1: CAO – fourth, fifth and sixth rows correct (for just the columns in x, y and t)
a3A1: CSO – including the output of 135 either on the given line in the answer book or clearly stated in the table but it must be absolutely clear that the output is the final t value (no bod). Furthermore, all ‘yes’ and ‘no’ comments must be present in the 4th and 5th columns with no additional/incorrect ‘yes’ or ‘no’

bi1B1: x must be 122 and any attempt at a reason
bi2DB1: Dependent on previous B mark (so B0B1 is not possible) – 122 and a correct valid reason – e.g. x must be an integer/whole number or ½ is not odd or even or if you input ½ then you can never get to x = 0 when halving, etc. Just saying that the algorithm ‘won’t work’ or that the algorithm‘will get stuck in a loop’ or ‘not terminate’ is not sufficient for this second mark neither is the argument of subtracting 1 from a ½. It must be clear why the algorithm won’t output a value for t with x = ½ - so essentially there needs to be some indication of why x will never become 0. Furthermore, just saying that x will never reach 0 is insufficient – we need an indication of why x = 0 is not possible with a starting value of x = ½
bii3B1: CAO</td></tr>
</table>

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<tr><td>Question Number</td><td>Scheme</td><td>Marks</td></tr>
<tr><td>3.(a)</td><td>
<table>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td></tr>
<tr><td>1 980</td><td>462</td><td>914 760</td><td>30/7</td><td>4</td><td>1848</td><td>132</td><td></td></tr>
<tr><td>462</td><td>132</td><td>(914 760)</td><td>7/2</td><td>3</td><td>396</td><td>66</td><td></td></tr>
<tr><td>132</td><td>66</td><td>(914 760)</td><td>2</td><td>2</td><td>132</td><td>0</td><td>13 860</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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</table>
</td><td>M1
A1
A1ft</td></tr>
<tr><td></td><td>Output 13 860</td><td>A1 (4)</td></tr>
<tr><td>(b)</td><td>Calculates the lowest common multiple of two numbers o.e. description</td><td>B1 (1)</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>5 marks</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">Notes for Question 3</td></tr>
<tr><td></td><td>Note values may be written on individual rows. Please award the marks for the complete rows shown above. The values in cell c do not need to be repeated in each row, but we will condone this.</td><td></td></tr>
<tr><td>a1M1</td><td>First row cells a to g completed – something in each cell</td><td></td></tr>
<tr><td>a1A1</td><td>First and second row correct. Accept decimal equivalent awrt 4.29 and 3.5 (h must have no numerical value in these rows)</td><td></td></tr>
<tr><td>a2A1ft</td><td>Third row correct – ft their first and second rows</td><td></td></tr>
<tr><td>a3A1</td><td>13 860 in Output row CSO</td><td></td></tr>
<tr><td>b1B1</td><td>LCM CAO (accept e.g. smallest common multiple, minimum common multiple, minimum common product, smallest number which can be divided by both a and b o.e.) (do not accept times instead of multiple or product)</td><td></td></tr>
</table>