M1. (a) time from when the heating is started until the limewater turns cloudy / milky

(b) (i) the temperature was not high enough
accept the copper carbonate had not started to decompose / react
accept it takes time to heat up the copper carbonate

the bubbles of gas were air
accept no carbon dioxide produced

(ii) the copper carbonate was decomposing / reacting
accept the temperature was high enough to cause decomposition / a reaction

so carbon dioxide was produced
allow correct word / symbol equation

(iii) copper oxide was produced
allow correct word / symbol equation

because the copper carbonate had completely decomposed / reacted
ignore all of the carbon dioxide had been given off
(a) (i) carbon dioxide / CO$_2$

carbonate / CO$_3^{2-}$

*answers must be in the order shown*
*marks are independent*

1

(ii) ammonia / NH$_3$

*answers must be in the order shown*
*marks are independent*

1

(b) (i) solution is blue

*accept blue precipitate only if sodium hydroxide added*
*allow blue liquid*
*allow copper sulfate / copper ions are blue*

1

(ii) barium chloride / BaCl$_2$

*allow barium nitrate / barium ions / Ba$^{2+}$*

1

white

*answers must be in the order shown*
*marks are independent*

1

[7]
M3. (a) limewater / calcium hydroxide

(limewater) goes milky / cloudy

*do not allow this mark if lime water added to solution or powder*

or

gives white precipitate / solid

1

(b) eg flame colour of (Na) and flame colour of (K) interfere / mask / mix with each other

*accept difficult to determine the colour*

*or*

*hard to distinguish*

*accept some indication that two distinct colours are not seen*

1

(c) (i) barium chloride (solution) / BaCl₂

*ignore mention of acidification but*

*do not allow sulfuric acid.*

*wrong reagent = no mark*

white precipitate / white solid

*allow white barium sulfate*

*or*

*barium sulfate precipitate*

1

(ii) white precipitate / white solid

*ignore goes milky*

*do not accept any mention of precipitate dissolving*

1
M4.  (a) hydrogen

    accept $H_2$,  
    do not accept $H$

(b) litmus paper / Universal Indicator paper / pH paper

    allow any suitable named indicator

    bleached / turns white or loses its colour
    do not accept bleached cloth / leaves etc.
    allow second mark unless incorrect indicator given

    allow starch iodide paper (1)
    goes black / blue black (1)
    allow potassium iodide solution (1) goes brown / orange / black precipitate (1)

(c) because they have a negative charge or opposite charges attract

    accept (because) it is $Cl^-$
    accept chlorine, $Cl$ or chlorine ions has a negative charge
    do not accept $Cl^-$ on its own
    do not accept $Cl$, o.e. has negative charge

(d) kill bacteria / germs, etc. or sterilise / disinfect

    accept destroys bacteria etc.
    ignore clean / purify water (owtte)
    do not accept just gets rid of bacteria

(e) hydroxide (ion)

    accept $OH^-$
M5.  

(a)  
(i)  H$_2$O, reactant correct  

*ignore any state symbols*  

1  

H$_2$O + O, products correct  

1  

2H$_2$O $\rightarrow$ 2H$_2$O + O, balanced  

*accept correct multiple*  

1  

(ii) glowing splint  

1  

relights  

*accept ‘bursts into flame’*  

*do not accept a lighted splint burns brighter or faster*  

1  

(b) unchanged  

*accept not used up or left (behind)*  

1  

(c)  
(i)  gas syringe or measuring cylinder either with scale drawn or labelled  

1  

the apparatus as drawn would work  

1  

(ii) correct plotting of points  

*one mark to be deducted for each error*  

2  

best fit graph line drawn (single line drawn)  

1  

(iii) concentration of hydrogen peroxide decreases  

*accept less particles of hydrogen peroxide to collide*  

1
do not accept hydrogen peroxide gets used up

rate of reaction decreases
accept reaction gets slower

(iv) any two from:

• temperature
• pressure
• division of catalyst or manganese oxide
do not accept any other factors
(a) oxygen/O₂
   
   for 1 mark

(b) water/H₂O
   
   for 1 mark

(c) carbon dioxide/CO₂
   (if symbols are used they must be correct)
   
   for 1 mark

(d) gives out
   
   for 1 mark

   heat or energy (2 independent marks)
   
   for 1 mark

[5]