M1.(a) time from when the heating is started until

1

the limewater turns cloudy / milky

1

(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

1

the bubbles of gas were air

accept no carbon dioxide produced

1

(ii) the copper carbonate was decomposing / reacting

accept the temperature was high enough to cause decomposition / a reaction

1

so carbon dioxide was produced

allow correct word / symbol equation

1

(iii) copper oxide was produced

allow correct word / symbol equation

1

because the copper carbonate had <u>completely</u> decomposed / reacted

ignore all of the carbon dioxide had been given off

1

[8]

M2. (a) (i) carbon dioxide / CO_2

1

carbonate / CO_3^{2-}

answers must be in the order shown

marks are independent

1

(ii) ammonia / NH_3

1

litmus

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

1

(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) / $BaCl_2$

ignore mention of acidification but

*do **not** allow sulfuric acid.*

wrong reagent = no mark

1

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

[6]

M4. (a) hydrogen

accept H_2
*do **not** accept H*

1

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

allow any suitable named indicator

1

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)

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_2 o.e. has negative charge*

1

(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*

1

(e) hydroxide (ion)

accept OH^-

1

[6]

M5. (a) (i) H_2O_2 reactant correct

ignore any state symbols

1

$H_2O + O_2$ products correct

1

$2H_2O_2 \rightarrow 2H_2O + O_2$ 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

*do **not** accept hydrogen peroxide gets used up*

1

rate of reaction decreases

accept reaction gets slower

1

(iv) any two from:

- temperature
- pressure
- division of catalyst **or** manganese oxide

*do **not** accept any other factors*

2

[15]

##

(a) oxygen/O_2

for 1 mark

1

(b) water/H_2O

for 1 mark

1

(c) carbon dioxide/CO_2

(if symbols are used they must be correct)

for 1 mark

1

(d) gives out

for 1 mark

1

heat or energy (2 independent marks)

for 1 mark

1

[5]