**YEAR 12 HOMEWORK EXERCISE 5 MS**

***Exercise 1*** Skill assessed **Analysing**

**Q1** plots points for 0-4 minutes correctly

plots points for 5-10 minutes correctly

straight line through the points before addition

line through the points after addition is smooth

line through the points after addition is best fit

extrapolation back is a natural extension of the drawn line \* must include

reads the temperature rise correctly from the graph correct extrap.

7 scoring points: any **6 = 2 marks**\*, any **3 = 1 mark**

**Notes** \* *If graph does not cover half of the paper, maximum score is 1 mark (write* ***scale*** *on the candidate’s graph)*

*mark up to first 3 correct points only*

*do not penalise again under nomenclature*

*If the graph plot goes off the squared paper maximum score is 1 mark;*

*do not penalise again under nomenclature*

*\* If axes unlabelled use data to decide that temperature is on y axis*

*\* Allow one incorrectly plotted point in each part*

\* “*smooth” means straight for a straight line*

\* *give best fit point if the student’s extrapolation is close to your extrapolation*

*\* “Correct extrapolation” means correct line to 4 minute ordinate*

**Q1** temperature rise 5.8 - 6.0 oC **1 mark**

**Notes** \* *Do* ***not*** *allow other answers*

**Q2** 2.42 to 2.51 kJ allow answer in J **1 mark**

**Notes** *\* Consequential marking from answer to Q2*

*\* Do* ***not*** *award this mark if candidate gets the correct answer by an incorrect*

*method; don’t penalise again in awarding the nomenclature mark*

**Q3** 4.75 x 10-2

51.0 to 52.8 kJ mol-1

2 scoring points **both = 1 mark**

**Notes** *\* Consequential marking from answer to Q1*

*\* Do* ***not*** *award mark if candidate gets a correct answer by an incorrect*

*method; don’t penalise again in awarding the nomenclature mark*

*\* Ignore sign of ΔH value; ignore in awarding the nomenclature mark*

**Q4 errors** measuring cylinder 2%

thermometer 1.7% based on 5.9o

total error 3.7%

3 scoring points **any 2 = 1 mark**

**Notes** \* *Ignore precision of answers*

*\* Consequential marking for thermometer from Q1 and for overall error*

\* *Penalise doubled errors* ***once***

*\** ***Lose mark*** *if answers wrong because (x 100) missing from calculations;*

*don’t penalise again in awarding the nomenclature mark*

*\* Which error being calculated is* ***not*** *stated; allow* ***if*** *the calculations are in the same*

*order as in the question. And do* ***not*** *penalise in nomenclature*

1. The **appreciation of precision**

quotes temp rise to 1 dp

quotes q to 3 significant figures **or** integer in answer in J

quotes molar enthalpy change to 3 significant figures

3 scoring points **any 2 = 1 mark**

**Notes***\* If no answers to Q2 and Q3 can’t score this mark*

1. The correct use of **nomenclature and terminology**

graph has sharp trace

explains the calculations clearly and logically

explains the calculation of the errors clearly

3 scoring points  **all 3 = 1 mark**

**Notes** \* *Graph with broad line or doubled line means mark is lost*

\* *Incorrect units mean the nomenclature mark is lost*

\* *Don’t penalise missing units*

*\** ***Two*** *blank sections mean the nomenclature mark is lost*

\* *Answer given in Q 3 or 4 without working means the*

*nomenclature mark is* ***lost***

**\* *Do not penalise for wrong calculation in Q 3 if explained clearly***

**Total 8 marks**

***Exercise 2*** Skill assessed **Evaluating**

**Q1** ignores result at 7 minutes when plotting graph **1 mark**

good straight line / results consistent or reliable **1 mark**

**Notes** \* *Allow first point in written answer to Q1 or clearly from the graph;*

*any contradiction on graph* ***loses*** *this mark*

*\* Must make a clear written comment for final point*

**Q2** difference is 3.2 - 4.0 2 scoring points

against 55.0 is a 5.8 to 7.3% error

2 scoring points **both = 1 mark**

**Notes** \* ***Lose mark*** *if no evidence of working in second part*

\* *Ignore precision of answers*

*\* Allow consequential answer from Q3 of Analysis*

*\* Difference must be clearly stated*

*\** ***Lose mark*** *if the candidate answers a different question*

*\* Using 48.5 gives difference is 6.5, and a 11.8% error*

**Q3** appreciates heat loss main source of error

appropriate improvement to insulation eg lid, more lagging**,** appropriate improvement

to calorimeter **or** calculates calorimeter constant

2 scoring points **both = 1 mark**

**Notes** \* ***Lose one mark*** *if answers to Q3 and Q4 reversed*

*\* Must give details of improvement*; “*use a better calorimeter” does* ***not*** *score point*

**Q4** appropriate source of error eg original temperature of acid & unequal

**or** temperature rise too small **1 mark**

appropriate improvement eg equilibrates reagent temps/ corrects initial temperature

**or** higher reagent concentrations **1 mark**

**Notes** \* *Do not allow ”repeats experiment”*

**Total 6 marks**