As Chemistry Paper 3 (Practical)

Quantitative Analysis

1. Titration

- burette table must include 3 headings i.e. initial burette reading, final burette reading and volume used with unit (cm^3).
- use pencil and ruler to draw titration table and record readings with pen.
- all accurate burette readings (initial and final) recorded to nearest 0.05 cm^3 (2dp).
- for rough reading you should make a table.
- 50.00 cm^3 should not be used as an initial burette reading.
- your two best reading must be within 0.10 cm^3.
- working must be shown and ticks must be put next to the two (or more) accurate readings selected for mean.
- the mean should normally be quoted to 2 dp rounded to the nearest 0.01. [*e.g*. 26.667 must be rounded to 26.67].
- do not include the rough titre to calculate the mean.
- final answers of all calculation parts should be within 3-4 significant figures.
- whenever mole ratio used in calculations always show that ratio.

Sample Titration Table

for rough reading

final burette reading / cm^3	
initial burette reading / cm^3	
volume used / cm^3	

for fair readings

final burette reading / cm^3				
initial burette reading / cm^3				
volume used / cm^3				

Common Formulae for Calculation

- $n = cV$ (volume must be in dm^3)
- $n = \frac{m}{Mr/Ar}$
- $mol.dm^{-3} = \frac{g.dm^{-3}}{Mr/Ar}$
- $c_1v_1 = c_2v_2$
- $error = \frac{least\ count}{2}$
- $\%\ error = \frac{error}{amount\ /value} x100$

2. Enthalpy Change

- table should include proper headings and their respective units i.e. Temperature/^{o}C.
- thermometer reading should be correct to 1 decimal place i.e. 29.0 or 29.5.
- if you are recording more than 5 thermometer readings then examiner expect at least one reading in 0.5 i.e. 25.5^{o}C and one reading in 0.0 i.e. 25.0^{o}C.
- during reaction mix reactants thoroughly to achieve maximum temperature as quickly as possible.
- to calculate heat energy use **= *m*CΔT** (***m*** should be mass of liquid which is equal to the volume of liquid).
- all final answers of calculation must be in 3 to 4 significant figures.

3. Rate of the Reaction

- table should include proper headings and their respective units.
- time should be recorded to the nearest second (*no dp*).

4. Thermal Decomposition

- table should include proper headings and their respective units i.e. mass of crucible/g.
- include all measured masses in the table with unit i.e. ***g***
- reheat crucible with contents until you get constant mass.
- final answers of all calculation parts should be within 3-4 significant figures.

Graph

- clearly label *x-axis* and *y-axis* with their respective units.
- point to point at least 50% area of the graph should be used on both axis.
- all points should be plotted.
- label the quantity each large box (10 small boxes).
- draw line of best fit/straight line/curve whatever written in the question.
- all points should be close to the line.

General Points

- whenever you use burette volume should be recorded in **2dp**.
- when pipette is used volume should be recorded in ***1dp***.
- when measuring cylinder is used volume may be recorded in ***1dp*** or ***0dp*** check given data in the question paper.
- thermometer readings should be correct to ***1dp***.

Qualitative Analysis

1. Inorganic

- draw a proper table with proper headings **i.e.** tests, observations.
- always use word aqueous or aq. with reagent name or formula if you are using an aqueous solution of the reagent.
- if you are adding aqueous NaOH or aqueous NH_3 in a solution, then add few drops then excess of that reagent (test for cations). Write down ppt. colour and their solubility in excess of that reagent.
- do not write ppt. colour cloudy or milky. Instead write white or off-white etc.
- if you are adding NaOH in a solution and heating that solution then this test is for NH_4^+ ion and NH_3 gas will be produced.
- when a gas releases always write test of gas and observation in observation column (not name of the gas).
- if you are adding an acid to any solution and effervescence of a gas produced then gas is CO_2 and anion present is CO_3^{2-}.

2. Organic

- in organic qualitative analysis you are supposed to identify the different organic functional groups i.e. aldehyde, ketone, alcohol, carboxylic acid etc.

Reagent/Tests	Adehyde	Alcohol	Carboxylic acid	Ketone
sodium carbonate			√	
magnesium metal		very slow reaction	√	
2,4-DNPH	√			√
tollen's reagent	√			
acidified $KMNO_4$	√	√		