

- You are provided with the following;
 - Solution **AA** containing 3.65g of pure hydrochloric acid per dm^3 of the solution
 - Solution **BB** containing 14.3g of hydrated sodium carbonate $[\text{Na}_2\text{CO}_3 \cdot \text{XH}_2\text{O}]$ per dm^3 of the solution
 - Solution **M.O** is methyl indicator.

Questions

- Titrate AA (in burette) against BB (in a conical flask) using two drops of your indicator and obtain three titre values. Record your data in a tabular form
 - cm^3 BB required cm^3 of AA for complete reaction
 - The colour change at the end point was from..... to.....
 - Showing your procedures clearly, calculate the value of X in the formula $[\text{Na}_2\text{CO}_3 \cdot \text{XH}_2\text{O}]$
 - List any two applications of volumetric analysis **(25 Marks)**
- Sample Q is a simple salt containing one cation and one anion. Carry out the experiments described below. Record your observations and inferences as shown in the table below

S/N	Experiment	Observation	Inference
(a)	Observe the appearance of sample Q		
(b)	Place a spoonful of sample Q in a test tube, add water and shake to dissolve		
(c)	Put a spatulaful of sample Q in a test tube and heat		
(d)	Put a spatulaful of sample Q in a dry test tube and add concentrated sulphuric acid		
(e)	To a portion of the solution add few drops of sodium hydroxide solution slowly till excess		
(f)	To another portion of the solution of sample Q in a test tube add aqueous ammonia slowly till excess		
(g)	To another portion of the solution of sample Q in a test tube add potassium iodide solution		
(h)	To another portion of the solution of sample Q in a test tube add freshly prepared ferrous sulphate solution followed by careful addition of $\text{Conc.H}_2\text{SO}_4$ along the side of the test tube.		

CONCLUSION

- (i) The cation present in Q is.....
- (ii) The anion present in Q is.....
- (iii) The chemical formula of Q is.....
- (iv) The chemical name of Q is.....
- (v) Write the balanced chemical equation for the reactions taking place in experiment (c)
(25 Marks)