



**CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE**

2010/2011 HARMATTAN SEMESTER EXAMINATIONS

COLLEGE: NATURAL AND APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

UNIT: BIOCHEMISTRY

COURSE CODE: BCH 219 COURSE UNIT: 1 TIME ALLOWED: 3 HOURS

COURSE TITLE: EXPERIMENTAL BIOCHEMISTRY 1

INSTRUCTION: ANSWER ALL QUESTIONS

1. You are provided with 0.10M solution of NaOH and HCl of unknown concentration. Titrate the HCl against 10ml of NaOH using phenolphthalein indicator.

- What is the most suitable title for the experiment above?
- Determine the volume of acid used in each titration step.
- What other indicators can be used instead of phenolphthalein?
- Derive a balanced chemical equation for the reaction in the titration above.
- What are the mole ratios of the reactants to products?
- Determine the molarity of the acid used in (mol/dm^3)
(H= 1; O= 16; Cl= 35.5; Na= 23)
- Calculate the concentration of the acid used in g/dm^3 .

ALTERNATIVE TO PRACTICAL

- Derive the Henderson-Hasselbalch equation and state two importance of this equation.
 - Define pH and pOH and obtain an equation that relates the two together.
 - What are the pH, pOH, $[\text{H}^+]$ and $[\text{OH}^-]$ of a solution of 0.002M HNO_3
- Mention at least one test that can be used to distinguish the following carbohydrates.
 - Polysaccharide and Other Sugars
 - Reducing and Non-reducing Sugars
 - Reducing monosaccharide and a reducing disaccharide
 - Glucose and Fructose.
 - Give two examples of reducing and non-reducing sugars.
- State the possible observations expected when casein is mixed with the following solvents?
 - Water
 - Chloroform
 - Acetone
 - Ethanol
 - Mention 4 reagents that can be used to precipitate proteins.

4. (a) Provide the inferences following the tests and observations in the table below:

TEST	OBSERVATION	INFERENCE
1. Solution A + water	No Dissolution	
2. Solution A + Ether	Dissolution	
3. Lipid + Alcoholic KOH	Soapy Appearance	
4. Palm oil + Ethanol	Partial Dissolution	
5. Ground/nut oil + 10 drops of Bromine water	Decolourization occurred	

(b) (i) Why did Solution A dissolve in Ether and not in water?

(ii) State the principle involved in No. 4 inside the table.

(iii) Mention ONE example of lipid that will not dissolve completely in Ethanol.

(iv) Mention FOUR inorganic solvents.

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