



CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE

2012/2013 HARMATTAN SEMESTER EXAMINATIONS

COLLEGE: NATURAL AND APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

PROGRAMME: B.Sc BIOCHEMISTRY

COURSE CODE: BCH 405 UNIT: 2 TIME ALLOWED: 3 HOURS

COURSE TITLE: EXPERIMENTAL BIOCHEMISTRY IV

STATUS: COMPULSORY

INSTRUCTION: ANSWER ALL QUESTIONS

SECTION A

You are provided with the following:

Spectrophotometer, Standard sugar solution ($120\mu\text{g/ml}$), Anthrone reagent, sample x and laboratory glassware.

1. Prepare a serial dilution of the standard sugar solution ($120\mu\text{g/ml}$) to cover 0.0, 48.0, 72.0, 96.0 and $120\mu\text{g/ml}$. Make each dilution to 1.0ml and place 1.0ml of each dilution and unknown sample X in a boiling tube, keeping all the tubes in the ice cold water, add 6.0ml of Anthrone reagent to each tube. Mix and place in a boiling water bath for 10 minutes. Read the absorbance at 620nm against the reagent blank.
 - (a) Calculate the volume (ml) of the sugar in each of the standard tubes;
 - (b) Prepare a table of value and plot the standard curve;
 - (c) Determine the concentration of the unknown sample X and use the value obtained to determine the concentration of sugar in 35.0cl Of soft drink;
 - (d) State the principle employed in the Anthrone method of carbohydrate determination.

SECTION B

ALTERNATIVE TO PRACTICAL

- 1(a) Define the following terms and state their significance:
 - (i) Acid value;
 - (ii) Iodine value;
 - (iii) Saponification value.
- (b) What is the function of the following reagents in the preparation and purification of starch from sweet potato tubers, starch amylose and amylopectin:

- (i) 1-butanol;
- (ii) 0.15% sodium hydrogen metabisulphite;
- (iii) 80% aqueous methanol.

2. Describe briefly the extraction of oil from coconut

3. Differentiate between the two components of starch based on the following:

- (i) Density;
- (ii) Solubility;
- (iii) Iodine value;
- (iv) Percentage composition;
- (v) Texture;
- (vi) Glycosidic linkages.

4. The concentration of a compound B, an amino acid, was determined spectrophotometrically at 275nm. Below are the data on absorption at 275nm of different concentrations of compound B:

| Concentration ($\mu\text{g/ml}$) | OD at 275nm |
|------------------------------------|-------------|
| 0 | 0.01 |
| 33 | 0.45 |
| 50 | 0.69 |
| 100 | 1.37 |
| 150 | 2.06 |
| 200 | 2.73 |
| Unknown concentration | 1.63 |

- (a) Calculate the volume (ml) of protein solution that should be added to the respective tube if the standard amino acid concentration is $200\mu\text{g/ml}$;
- (b) Prepare a table of value;
- (c) With the data provided, plot a standard curve on the graph paper;
- (d) Determine the unknown concentration of X in $\mu\text{g/ml}$ and $\mu\text{g}/100\text{ml}$.