



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY AND BIOTECHNOLOGY

SBC 102 : LABORATORY TECHNIQUES I

DATE: TUESDAY 27TH MARCH 2012

TIME: 4.30 P.M. – 6.30 P.M.

INSTRUCTIONS

Answer all questions

1. Briefly explain the principle of the Biuret method. (5 Marks)
 - a. What was the role of a standard curve in this experiment? (3 Marks)
 - b. Using an example explain a test what would give similar results to Biuret method. (4 Marks)
 - c. Why is the Biuret reagent prepared in an alkaline environment. (3 Marks)
2. In an experiment you were provided with a sample suspected to contain carbohydrates and asked to test for them. Was the experiment qualitative or quantitative and give a reason for your answer. (3 Marks)
 - a. Classify tests for carbohydrates into two based on the principle. (4 Marks)
 - b. Differentiate the following test. (2 Marks)
 - i. Molisch test and Benedict's test.
3. In an experiment, gel filtration was used to purify hemoglobin. What is the principle of this test? (5 Marks)
 - a. Define the following terms. (4 Marks)
 - i. Mobile phase
 - ii. Solid phase
 - iii. Retention time
 - iv. Elution

- b. Does proteins of the same molecular weight and different shape elute at the same time. Explain your answer. **(3 Marks)**
- c. Using an illustration describe the elution profile diagram. **(3 Marks)**
4. Define amino acid titration **(2 Marks)**
- a. Illustrate titration of glycine using sodium hydroxide (NaOH) solution. **(5 marks)**
- b. Which group of glycine (amino group or carboxylic group) deprotonates first and why. **(3 Marks)**
- c. Explain the relationship between the pH and the net charge of an amino acid **(3 Marks)**
- d. Distinguish the following terms. **(2 Marks)**
- i. Zwitterion and iso-electric point.
5. In an experiment you examined the protein components of the fractions isolated from human blood plasma by cellulose acetate electrophoresis.
- a. Define the term electrophoresis. **(2 Marks)**
- b. Why should you avoid touching the membrane with your fingers. **(3 Marks)**
- c. Gamma-globulin has an isoelectric point of about 7. Briefly explain towards which electrode you expect to migrate at pH 8.4. **(4 Marks)**
- d. The protein stain used in this experiment was prepared in Trichloroacetic acid (TCA). Why is the TCA necessary? **(3 Marks)**
- e. Suggest way in which protein concentration can be determined in this experiment. **(3 Marks)**