



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (PLANT IMPROVEMENT AND PROTECTION) AND BACHELOR OF EDUCATION (SCIENCE)

KST 205: BIOCHEMISTRY OF AGRICULTURALISTS

DATE: Thursday 29th March 2012

TIME: 2.00p.m – 4.00p.m

INSTRUCTIONS

Answer all questions in section A and any two in section B.

Section B (40 marks)

1. a) Show structural ring formula of α – D-ribose. [2marks]
b) Show and name the structure that is formed when hydroxyl group is replaced by hydrogen ion at C₂ and state its importance. [3marks]
2. Concisely demonstrate full acetal formation by plants and state the significance of this process to agricultural crops. [5marks]
3. a) Define the term mutarotation. [1mark]
b) Using D-glucopyranose, demonstrate the above phenomenon in (a) above [4marks]
4. a) Distinguish between laevarotory and dextrorotatory. [2marks]
b) Compare and contrast D-glyceraldehyde and Dihydroxyacetone [3marks]
5. a) Outline the physical and chemical properties of xylose. [3marks]

- b) Show the structural orientation of the ketonic form of sugar in (a) above. [2marks]
6. Draw a structure of α – D-glucopyranosyl-(1-4-glucopyranoside and describe its reactions with Fehlings reagent. [5marks]
7. Describe electrophoresis as a technique of separating individual amino acids from protein hydrolysates. [5marks]
8. Classify simple proteins on the basis of solubility properties. [5marks]

Section B (30 marks)

9. Describe mechanisms of regulation and inhibition of protein synthesis in higher agricultural plants. [15marks]
10. Discuss properties of enzymes and enumerate factors that affect their activity. [15marks]
11. Describe chemical properties of lipids and highlight the significance of these properties to both industrialists and livestock farmers. [15marks]
12. a) Discuss the formation of root nodules in a specified crop plant. [9marks]
- b) Give account of factors that control biological nitrogen fixation. [6marks]