KENYA POLYTECHNIC UNIVERSITY COLLEGE

SCHOOL OF HEALTH SCIENCES AND TECHNOLOGY

DEPARTMENT OF COMMUNITY AND PUBLIC HEALTH

DIPLOMA IN COMMUNITY AND PUBLIC HEALTH

END OF STAGE 1 EXAMINATIONS

NOVEMBER 2011

BIOCHEMISTRY

TIME 2 HOURS

Instructions to candidates
This paper consists of two sections A and B
Section A is compulsory – Answer **ALL** questions in this section
Answer any **THREE** questions from section B

This paper consists of 3 printed pages

Section A – Compulsory
Answer ALL questions in this section

1. Explain the following reactions
   a) Transamination
   b) Oxidative deamination (4mks)

2. Give three functions of each of the following
   a) Adipose glucose (3mks)
   b) Lipoproteins (3mks)

3. Use simple structures to illustrate the formation of a triglyceride (4mks)

4. Define the following terms
   a) Isomerism
   b) Racimic mixture
   c) Peptide bond
   d) Glucopyranose (4mks)

5. Discuss how hyperglycemia could bring about alveolar Hyperventilation (5mks)

6. List two physiological uses of the following substances in the human body
   a) Oxaloacetic acid
   b) Ketoglutaric acid
   c) Acetyl coA (3mks)

7. Differentiate between furanoses and osazones (2mks)

8. Name a test done to identify the following sugars
   a) Galactose
   b) Sucrose
   c) Fructose
   d) Blood sugar (4 mks)

9. Give two chemical properties of
   a) Lipids
   b) Amino acids (4 mks)

10. Explain the following
    a) Ketosis
    b) Cori cylce (4mks)

Section B – Answer any THREE questions in this section

11 a) Explain how Glucose metabolism is closely related to that of lipids (8mks)

b) The properties of amino acids is a function of their ionizations in different buffers. Explain (6mks)

c) Illustrate the synthesis of vitamin D_3 cholesterol (6mks)

12. a) List ONE advantage and ONE disadvantage for each of the following
   i) Adipose Glucose (2 mks)
   ii) Tricarboxylic Acid Cycle (2 mks)
   iii) Lipids (2 mks)
   iv) Albumen (2 mks)

b) Discuss
   i) The regulation of blood sugar concentrations (6mks)
   ii) The clinical manifestations of a protein loosing phenomenon (6mks)

13. a) Explain why the clinical manifestations of diabetic mellitus look similar to those of starvation (8mks)

b)Discuss the role played by the following Lipoproteins in the management of lipid metabolism
   i) Low Density Lipoprotein (LDL)
   ii) High Density Lipoprotein (HDL)
   iii) Chylomicrone
   iv) Very Low Density Lipoprotein (VLDL) (12mks)

14. a) Explain the dynamic equilibrium of blood proteins and amino acids, and its regulation (6mks)

b) Summarize the oxidative deamination of the amino acid Glycine to produce oxalic acid (6mks)

c) Discuss the following conditions
   i) Hypo vitaminosis D (4mks)
   ii) Systemic hypertension (4mks)