



MERU UNIVERSITY COLLEGE OF SCIENCE & TECHNOLOGY

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University Examinations 2012/2013

SECOND YEAR, FIRST SEMESTER EXAMINATIONS FOR DIPLOMA IN
AGRICULTURAL EDUCATION AND EXTENSION

BIO 0210: AGRICULTURAL BIOCHEMISTRY

DATE: DECEMBER 2012

TIME: 1½ HOURS

INSTRUCTIONS: Answer questions *one* and any other *two* questions.

SECTION A

QUESTION ONE – (30 MARKS)

- (a) Define the following terms
- (i) Monomer (2 Marks)
 - (ii) Biochemistry (2 Marks)
 - (iii) Vitaminosis (2 Marks)
- (b) Give four differences between prokaryotic and eukaryotic cells (4 Marks)
- (c) Differentiate between microminerals and macrominerals. Give an example of each. (4 Marks)
- (d) List two functions of lipids. (2 Marks)
- (e) Classify vitamins into two groups. (2 Marks)
- (f) Why do strict vegetarians require vitamin B complex supplements? (2 Marks)
- (g) List four nitrogenous bases found in nucleic acids? (4 Marks)
- (h) Biomembranes play a very important role of transport of substances. What is meant by
- (i) Facilitated diffusion (2 Marks)
 - (ii) Co-transport (2 Marks)
 - (iii) Endocytosis (2 Marks)

SECTION B

QUESTION TWO – (15 MARKS)

- (a) Name three molecular components/organelles found in a cell. Give one function of each organelle named. (6 Marks)
- (b) Draw structure of a cell membrane and show the following. (4 Marks)
- (i) Protein molecules
 - (ii) Transport channel
 - (iii) Lipid bilayer
- (c) List five functions of cell membrane (5 Marks)

QUESTION THREE – (15 MARKS)

- (a) Give the basic formula of carbohydrates. (2 Marks)
- (b) Define the following
- (i) Monosaccharide (1 Mark)
 - (ii) Disaccharide (1 Mark)
 - (iii) Polysaccharide (1 Mark)
- (c) What is the name given to sugars containing the following number of carbon atoms?
- (i) Three
 - (ii) Five
 - (iii) Six (3 Marks)
- (d) Give four functions of carbohydrates (4 Marks)
- (e) Name two types of storage carbohydrates (2 Marks)
- (f) Name the type of bond that links monomers in carbohydrates? (1 Mark)

QUESTION FOUR – (15 MARKS)

- (a) Draw the structure of water molecule showing its dipole ends. (3 Marks)
- (b) Give four characteristics of water. (4 Marks)
- (c) Water structure is maintained by many different types of chemical bonds. List four types of such bonds. (4 Marks)
- (d) Which of the bonds is responsible for the high melting point of water. (1 Mark)
- (e) Why does oil and water form two layers when mixed in a test tube? Draw and name the two layers showing the hydrophobic and hydrophilic ends. (3 Marks)