# CHUKA UNIVERSITY

## UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF BACHELOR OF EDUCATION SCIENCE**

**BOTA 413: MOLECULAR AND MICROBIAL GENETICS**

**STREAMS: BED (SCIE) Y4S2** **TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 10/12/2014** **8.30 AM – 10.30 AM**

**INSTRUCTIONS:**

**Answer All Questions in Section A and Two Questions in Section B**

**SECTION A (30 MARKS)**

1. (a) Use an illustration to distinguish between a ribose and deoxyribose sugar. [3 marks]

   (b) Explain the dispersive model of DNA replication. [3 marks]

2. (a) Describe four characteristics of the genetic code. [4 marks]

   (b) Name two types of cellular RNA molecules. [2 marks]

3. (a) Differentiate between mis-sense and non-sense mutations of the genetic code. [4 marks]

   (b) Explain the chemical difference between purines and pyrimidines. [2 marks]

4. (a) Describe Mcleod and Mc Carty's (1944) experiment to explain transformation in bacteria. [5 marks]

   (b) State one beneficial effect of point mutations. [1 mark]

5. (a) State the role of Agrobacterium tumefasciens in plant transformation. [2 marks]

   (b) Explain the chemical method of transferring a target gene to a cell. [4 marks]

**SECTION B (40 MARKS)**

6. Discuss the mechanism of DNA replication using a specific model. [20 marks]

7. Discuss chromosomal mutations and state their effects on a population. [20 marks]

8. Describe the role of biotechnology in agriculture. [20 marks]

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