

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**FOURTH YEAR EXAMINATIONS FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE**

**BOTA 412: PLANT BIOTECHNOLOGY**

**STREAMS: B.sc (Y4S2)**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 9/12/2014**

**8.30 A.M – 10.30 A.M.**

**Instructions: Answer All questions in section A and any Two in section B**

1. (a) State the composition of nucleotides in the DNA molecule. [3 marks]  
(b) Distinguish between purines and pyrimidines. [3 marks]
2. (a) State the peculiar characteristics of DNA polymerase III in DNA replication. [4 marks]  
(b) State the role of tRNA in DNA translation. [2 marks]
3. (a) Explain the role of restriction endonucleases in recombinant DNA technology. [2 marks]  
(b) Name four examples of restriction endonucleases used in microbial genetic engineering. [4 marks]
4. (a) Outline the chemical process of isolating plasmid DNA from microbe cells. [4 marks]  
(b) Define the term electroporation as used in plant transformation. [2 marks]
5. (a) State four uses of polymerase chain reaction (PCR) in life. [4 marks]  
(b) Name the organism used to isolate the DNA polymerase enzyme used in PCR reactions. [2 marks]

**SECTION B (40 MARKS)**

6. Compare and contrast the effect of genetic engineering to the human population. [20 marks]
  7. Describe the advantages of plant transformation to agriculture. [20 marks]
  8. Discuss the possible challenges of gene cloning. [20 marks]
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