

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FOURTH YEAR EXAMINATION FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE (GENERAL)

BOTA 412: PLANT BIOTECHNOLOGY

STREAMS:

TIME: 2 HOURS

DAY/DATE: FRIDAY 8/12/2017

8.30 A.M - 10.30 A.M.

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INSTRUCTIONS:

- Answer all the Questions in Section A and any other TWO in Section B

SECTION A: [30 MARKS] ANSWER ALL THE QUESTIONS

1. Explain why DNA is the cornerstone of biotechnology. [3 Marks]
2. State and explain three ways that can be used to determine if a plant tissue has acquired a foreign gene during transformation. [3 Marks]
3. Name three restriction endonucleases and state the base sequences they detect. [3 Marks]
4. State the roles of bacteriophage viruses as cloning vectors in recombinant DNA technology. [3 Marks]
5. Explain three stages of plant tissue culture. [3 Marks]
6. Plasmid instability has a negative effect on gene cloning. Explain. [3 Marks]
7. Explain possible effects of the 'terminator gene technology' to agriculture. [3 Marks]
8. State the requirements for a successful PCR reaction. [3 Marks]
9. Define the term 'nucleic acid hybridization'. [3 Marks]
10. Use two examples to explain the role of *Bacillus thuringiensis* in plant transformation [3 Marks]

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**SECTION B [40 MARKS] - ANSWER ANY TWO QUESTIONS**

11. Discuss different methods of plant transformation. [20 Marks]

12. Describe the procedures and principles behind gel-electrophoresis and polymerase chain reaction. [20 Marks]

13. Discuss the benefits of plant transformation to agriculture. [20 Marks]

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