

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF AGRICULTURE**

AGRI 328: BIOTECHNOLOGY IN AGRICULTURE

STREAMS: BSC (AGRIC)

TIME: 2 HOURS

DAY/DATE: TUESDAY 10/12/2019

2.30 PM – 4.30 PM

INSTRUCTIONS:

SECTION A (30 MARKS) – ANSWER ALL QUESTIONS

1. Describe a eukaryotic cell and explain how it differs from a prokaryotic cell. [6 marks]
2. Describe the role of the cell cycle and explain how it ensures DNA content remains the same. [6 marks]
3. Explain any six areas where biotechnology is being used to address problems in agricultural production and food processing. [6 marks]
4. (a) Describe molecular markers and give three reasons why it is limited in scope than genetic engineering. [6 marks]
- (b) Describe the denaturation stage of the PCR process and explain the principle behind it. [6 marks]

SECTION B (40 MARKS) – ANSWER ANY TWO QUESTIONS

5. (a) Describe genetic engineering and the three possible types of modifications. [5 marks]
- (b) What is a vector? Explain the four characteristics of a good vector. [5 marks]

- (c) Describe a plasmid as a DNA cloning vector. [10 marks]
6. (a) Explain any eight applications of the plant tissue culture technique. [8 marks]
(b) Discuss germplasm storage and somatic embryogenesis as tissue culture application techniques. [12 marks]
7. (a) Describe DNA cloning and explain the electroporation method of indirect gene transfer. [10 marks]
- (b) Discuss male sterility and fertility restoration in transgenic plants through gene transfer methods. [10 marks]
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