

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

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

**HORT 225/325: BIOTECHNOLOGY**

**STREAMS: BSC HORT**

**TIME: 2 HOURS**

**DAY/DATE: MONDAY 01/11/2021  
P.M.**

**11.30 A.M. – 1.30**

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**Section A – Answer All Questions in this Section (30 marks)**

1.
  - a) Describe some of the basic principles in DNA replication process. (4 marks)
  - b) Explain the major difference between traditional plant breeding and genetic engineering. (4 marks)
  - c) Explain the five basic steps involved in recombinant DNA technique. (5 marks)
  - d) Describe the annealing step in a PCR process. (5 marks)
2. Describe any three advantages that a farmer can gain in adopting tissue culture bananas in Kenya. (6 marks)
3. Describe the term vector and explain five qualities of a good vector. (6 marks)

**Section B - Answer Any Two Questions (40 marks)**

4.
  - a) Describe the term totipotency and explain any 7 tissue culture techniques that offer advantages over traditional propagation methods. (10 marks)

marks)

b) Describe meristem culture of virus free plants through micropropagation. (10 marks)

5.

a) Describe somatic embryogenesis in plant culture. (3 marks)

b) Explain the exponential phase in the industrial fermentation process. (7 marks)

c) Explain how biotechnology can be used to enhance human nutrition in food products. (10 marks)

6.

a) Explain the role of magnesium ions in a polymerase chain reaction (PCR) process.

(5 marks)

b) Discuss an area of choice where you feel Kenya could benefit in the use of biotechnology to improve agriculture. (15 marks)

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