



*(Knowledge for Development)*

**KIBABII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**  
**2022/2023 ACADEMIC YEAR**  
**THIRD YEAR SECOND SEMESTER**  
**MAIN EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE  
ECONOMICS AND RESOURCE MANAGEMENT**

**COURSE CODE: AAP 322**

**COURSE TITLE: BIOTECHNOLOGY IN RUMINANT  
PRODUCTION**

**DATE: 25<sup>TH</sup> APRIL 2023**

**TIME: 9 – 11 AM**

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**INSTRUCTIONS TO CANDIDATES**

**Answer Question ONE and any other TWO Questions.**

**TIME: 2 Hours**

**This paper consists of 3 printed pages. Please Turn Over**



**KIBU observes ZERO tolerance to examination cheating**

## QUESTION ONE

- a. Outline the three major constraining factors that influence the productivity in the livestock sector **(3 marks)**
- b. Explain the term gene mapping and list types of genetic maps **(3 marks)**
- c. Define the following terms
  - i. Prebiotics **(2 marks)**
  - ii. Probiotics **(2 marks)**
  - iii. Biotechnology **(2 marks)**
- d. Briefly describe the following Antigen-antibody interaction-based techniques
  - i. Monoclonal antibodies **(4 marks)**.
  - ii. Enzyme-Linked Immunosorbent **(4 marks)**
- e. Which of the following statement is NOT true for genetic markers? Explain **(4 marks)**
  - a) A gene or a DNA sequence
  - b) Associated with a particular trait
  - c) Anything can be used as a genetic marker
  - d) The first genetic map was prepared was of fruit fly
- f. Outline the advantages of using embryo transfer technology in animal breeding **(2 marks)**
- g. Which of the following technique is used for the amplification of DNA fragments? Explain. **(4 marks)**
  - a) AFLP
  - b) RFLP
  - c) RAPD
  - d) SNP

## QUESTION TWO

Discuss different methods of gene mapping **(20 marks)**

## QUESTION THREE

Write short notes on

- i. Immunotherapy **(4 marks)**
- ii. Nanotechnology **(4 marks)**
- iii. Vaccination **(4 marks)**

- iv. Cytokine Therapy (**4 marks**)
- v. Proteomics (**4 marks**)

#### **QUESTION FOUR**

- i. Discuss different DNA-based diagnostic techniques (**10 marks**)
- ii. Discuss the application of biotechnology in animal breeding (**10 marks**)

#### **QUESTION FIVE**

- i. Discuss the approaches to automate oestrus detection in animal breeding (**10 marks**)
- ii. Describe different types of molecular markers and their shortcomings (**10 marks**)