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**UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR**

**THIRD YEAR SECOND SEMESTER  
SPECIAL/SUPPLEMENTARY 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: 11<sup>TH</sup> AUGUST 2023**

**TIME: 8 – 10 AM**

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**INSTRUCTIONS TO CANDIDATES**

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

**TIME: 2 Hours**

**This paper consists of 2 printed pages. Please Turn Over**



**QUESTION ONE**

- a. Outline the applications of molecular markers **(4 marks)**
- b. Explain the term gene mapping and list types of genetic maps**(4marks)**
- c. Explain the differences between prebiotics and probiotics **(4 marks)**
- d. Briefly describe the following DNA-based diagnostic techniques
  - i. Restriction fragment length polymorphism **(4 marks)**.
  - ii. Nucleic acid hybridization technique **(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. Outline the application of gene mapping in breeding **(4marks)**

**QUESTION TWO**

Discuss the application of biotechnology in animal breeding **(20 marks)**

**QUESTION THREE**

- 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)**

**QUESTION FOUR**

- i. Discuss different Antigen-antibody interaction-based techniques **(10 marks)**
- ii. Discuss various methods of gene mapping **(10 marks)**

**QUESTION FIVE**

Write short notes on

- i. Antibiotic growth promoter **(4 marks)**
- ii. Acidifiers **(4 marks)**
- iii. Cytokine Therapy **(4 marks)**
- iv. Proteomics **(4 marks)**
- v. Immunotherapy **(4 marks)**