



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**THIRD YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE  
DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE**

**2016/2017 ACADEMIC YEAR**

**REGULAR**

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**COURSE CODE: AAS 3321**

**COURSE TITLE: Biotechnology in Animal Production**

**EXAM VENUE:**

**STREAM: BSc. (Animal Science)**

**DATE:**

**EXAM SESSION:**

**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer ALL questions in section A and ANY other 2 Questions in section B.**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

**SECTION A: 30 MARKS (ANSWER ALL QUESTIONS)**

**Question one**

- a) In each of the following branches of animal science, briefly describe any two key biotechnological techniques currently being used in livestock systems giving an advantage and disadvantage for each
- i) Reproduction (4 marks)
  - ii) Breeding and genetics (4marks)
  - iii) Animal health (4 marks)
- b) Define the term biotechnology (2 marks)

**Question two**

- a) Elaborate on the effects of live yeast probiotics on ruminal fibre-degradation (5 marks)
- b) Highlight the concerns that the public has with genetically engineered livestock products (5 marks)
- c) Explain the rationale behind the ban of antibiotics as growth promoters and two possible solutions towards providing alternatives (4 marks)
- d) Highlight two strengths of recombinant DNA produced vaccines over conventional vaccines (2 marks)

**SECTION B: 40 MARKS (Answer ANY TWO questions from this Section)**

**Question three**

- a) Highlight the occurrence and impact of the following in the feeding of livestock citing biotechnological measures to mitigate their effects in feeding animals
- i) Phytic acid (4 marks)
  - ii) Non starch polysaccharides (4 marks)
  - iii) Aflatoxins (4 marks)
  - iv) Lignin (4 marks)
- b) Outline the qualities that antibiotics used as growth promoters should possess (4 marks)

**Question four**

- a) Highlight three primary means through which a ruminant animal buffers acid sources (3 marks)
- b) Pin point critical times that necessitate use of buffers in the feeding of ruminant animals (7 marks)
- c) Give five examples of compounds used as dietary buffers in the modern dairy industry (5 marks)
- d) Using examples, illustrate the use of hormones in animal production (5 marks)

**Question five**

- a) Define probiotics, their role and mode of action of probiotics in poultry diets (10 marks)
- b) Rumen manipulation is key in altering fermentation products that ultimately influence production. Briefly discuss five biotechnological techniques that can be employed to alter type, number and activity of rumen microorganisms (10 marks)