



**MACHAKOS UNIVERSITY**  
University Examinations for 2022/2023 Academic Year

**SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES**  
**DEPARTMENT OF AGRICULTURAL SCIENCES**  
**THIRD YEAR FIRST SEMESTER EXAMINATION FOR**  
**BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENSION)**  
**ANS 433: ANIMAL NUTRITION AND LIVESTOCK FEEDING**

**DATE:**

**TIME:**

---

**INSTRUCTIONS:** Answer **Question ONE (Compulsory)** and Any other **Two** Questions.

**QUESTION ONE (COMPULSORY) (30 MARKS)**

- a) Explain the following terms / concepts as used in animal nutrition science;
- i) Roughage. (1 mark)
  - ii) Ration formulation. (1 mark)
  - iii) Feed Pelleting. (1 mark)
- b) Differentiate the following terms / concepts in animal nutrition;
- i) Gizzard and Proventriculus. (2 marks)
  - ii) Feed supplements and Feed additives. (2 marks)
- c) On a DM basis, a citrus pulp sample contains 9% CP and dry matter content is 25% on as-fed basis. Calculate the %CP on as-fed basis. (5 marks)
- d) Soyabean contains 45%CP and Corn contains 10%CP and these feedstuff are the only available materials to a dairy farmer for ration formulation for the dairy cattle requiring 14%CP. Calculate the amounts of soyabeans and corn required by farmer to formulate the rations. (6 marks)
- e) Explain SIX factors considered in formulating standard commercial animal feeds. (6 marks)
- f) Explain the role of the government in the animal feeds manufacturing industry.

(6 marks)

**SECTION B (40 MARKS) ANSWER ANY TWO QUESTIONS**

**QUESTION TWO (20 MARKS)**

- a) Explain FIVE opportunities in animal nutrition and feeding. (5 marks)
- b) Explain FIVE challenges and opportunities in animal nutrition and feeding. (5 marks)
- c) Discuss the digestion of maize grains in chicken birds reared by farmers. (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Explain FOUR common contaminants in animal feeds in Kenya. (8 marks)
- b) Discuss SIX influencers of the performance of the livestock feed industry. (12 marks)

**QUESTION FOUR (20 MARKS)**

- a) Describe FOUR ways used by livestock farmers to conserve forages for ruminant animals (10 marks)
- b) Explain FIVE factors contributing to frequent feed scarcity the livestock farmers are facing in the livestock sector (10 marks)

**QUESTION FIVE (20 MARKS)**

Discuss the different stages of processing of feedstuff in feed milling plant.