



FACULTY OF NATURAL RESOURCES MANAGEMENT AND AGRICULTURE
DEPARTMENT OF ANIMAL PRODUCTION AND HEALTH

BACHELOR OF SCIENCE HONOURS DEGREE IN ANIMAL PRODUCTION AND
HEALTH

ANIMAL NUTRITION (NAP 2103)

FINAL EXAMINATION

Semester I, Examination

November 2024

Time Allowed : 3 hours
Special requirement : Calculator
Examiner : Mr B Mpala

Instructions to Candidates:

1. This paper consists of six questions, answer **ALL** questions in **Section A** and **ANY TWO** in **Section B**.
2. Marks for each question are shown in brackets. Where a question has subdivisions, the marks for each subdivision are given.
3. Illustrate your answer, where applicable, with large clearly labelled diagrams.

MARK ALLOCATION PER SECTION	MARKS
SECTION A	60
SECTION B	40
TOTAL ATTAINABLE MARKS	100

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SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION 1

- a) Explain the following terms as used in animal nutrition:
- i) Essential amino acids. [2]
 - ii) Total mixed ration. [2]
 - iii) Trace minerals. [2]
 - iv) Roughages. [2]
- b) Outline the six classes of nutrients, describing the functions of each nutrient in the animal body. [12]

QUESTION 2

- a) Describe the key differences between the digestive anatomy of ruminants and non-ruminants. [12]
- b) Discuss the role of saliva and stomach secretions in digestion of food in non-ruminant animals. [8]

QUESTION 3

- a) An 80 kg ram consumed 3.4 kg of grass hay with a moisture content of 3.2% and excreted 1.4 kg dung dry matter of which 0.1 kg were metabolic products from the animal's body. Calculate:
- i). Dry matter intake. [2]
 - ii). Apparent digestibility coefficient of the hay. [3]
 - iii). True digestibility coefficient of the hay. [3]
 - iv). State any two constituents that can be found in the 0.1 kg metabolic products in the ram excreta. [2]
- b) Discuss how palatability, environmental factors, and the physiological state of the ram will influence the consumption of grass hay. [10]

SECTION B: ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION 4

Write short notes on the following feed additives or growth enhancers used in animal nutrition:

- a) Beta agonists. [5]
- b) Enzyme. [5]
- c) Ionophores and methane inhibitors. [5]
- d) Probiotics. [5]

QUESTION 5

- a) Discuss the factors that affect the utilisation of urea in ruminant nutrition. [8]
- b) Discuss three methods used in ration formulation. [12]

QUESTION 6

Evaluate the stock feed manufacturing industry in Zimbabwe, focusing on feed quality standards, legislation, and the economic impact of feed on industrial animal production. [20]