



**ROBERT MUGABE SCHOOL OF EDUCATION  
AND CULTURE**

**DEPARTMENT OF TECHNICAL EDUCATION**

**BACHELOR OF EDUCATION PRIMARY IN-SERVICE  
HONOURS DEGREE**

**LEVEL 1 SEMESTER 2**

**EXAMINATION QUESTION PAPER**

**MODULE CODE : TSAG 122**  
**MODULE NARRATION : ANIMAL NUTRITION**  
**DATE : 2024**  
**DURATION : 3 HOURS**

**INSTRUCTIONS TO CANDIDATES:**

- Answer any **THREE** questions
- All questions carry equal marks

1. Describe the following energy systems:

- i) Digestible energy [5]
- ii) Faeces energy [5]
- iii) Metabolizable energy [5]
- iv) Net energy [5]
- v) Gross energy [5]

2. a) Discuss how the following are determined by Proximate analysis:

- i) Water [5]
- ii) Crude protein [5]
- iii) Ether extract [5]

b) Illustrate how Pearson square is applied in feed formulation [10]

3. a) Distinguish giving examples between essential and non-essential amino acids [10]

b) Discuss the following classification of feed:

- i) Cereals [7]
- ii) Legumes and oil seeds [8]

4. a) Describe the following methods of feed processing and the benefits of each:

- i) Physical methods [5]
- ii) Chemical methods [5]
- iii) Thermal methods [5]
- iv) Biological methods [5]

b) Discuss link between the season and nutritional status of rangeland forages during the following seasons: [5]

5. a) Discuss the following factors on Voluntary Feed Intake:

i) Palatability [4]

ii) Physiological animal state [4]

iii) Water availability [4]

iv) Feed quantity [4]

v) Feed quality [4]

b) Describe the importance of tannins in animal nutrition [5]

***END OF PAPER.***