

**THE NATIONAL UNIVERSITY OF LESOTHO**  
**FACULTY OF AGRICULTURE**  
**DEPARTMENT OF ANIMAL SCIENCE**  
**B.Sc. AGRICULTURE (ANIMAL SCIENCE) EXAMINATION**  
**ANS 2504: AGRICULTURAL BIOCHEMISTRY**

**MAY 2023**

**MARKS: 100**

**TIME: 3 Hours**

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**Answer all questions**

### QUESTION 1

- a) Explain the term “Amino acids” by clearly indicating its structural components. [4]
- b) List the three conjugated proteins (Prosthetic groups) and give an example of each. [6]
- c) Name the common Nucleic acids. [2]
- d) Explain the structural difference between the two nucleic acids [8]

### QUESTION 2

Using appropriate examples, differentiate between the following:

- a) Fibrous and Globular proteins [6]
- b) Nucleotides and Nucleosides [4]

### QUESTION 3

Which two of the following fatty acids are unsaturated? Explain why and write their numeric designation; [10]

- a) Myristic Acids  $\text{CH}_3(\text{CH}_2)_{12}\text{COOH}$
- b) Palmitic Acid  $\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$
- c) Palmitoleic Acid  $\text{CH}_3(\text{CH}_2)_5 \text{C}=\text{C}(\text{CH}_2)_7\text{COOH}$
- d) Stearic Acid  $\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$
- e) Oleic acid  $\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$
- f) Linoleic Acid  $\text{CH}_3(\text{CH}_2)_7\text{C}=\text{C}(\text{CH}_2)_7\text{COOH}$

### QUESTION 4

- a) Show the structural difference between aldehydes and ketones functional groups. [6]
- b) Explain the term “Disaccharide” and give two common examples. [4]
- c) Describe the molecular formulae, bonding components and linkage arrangement of **sucrose** and **lactose**. [10]

### QUESTION 5

- a) List the two forms in which starch exist and explain their main difference in structure and existence. [10]
- b) Explain four chemical properties of monosaccharides. [12]

### QUESTION 6

- a) What is a chiral molecule? Give an example of a chiral molecule and structurally indicate a chiral carbon. [10]
- a) With an aid of structural examples, differentiate between positional isomerism and metamerism. [10]

**END!!!**