



**GWANDA STATE UNIVERSITY**

**FACULTY OF NATURAL RESOURCES MANAGEMENT & AGRICULTURE**

**DEPARTMENT OF HORTICULTURE & CROP PRODUCTION**

**BACHELOR OF SCIENCE HONOURS DEGREE IN HORTICULTURE AND CROP  
PRODUCTION/BACHELOR OF SCIENCE (HONOURS) DEGREE IN LIVESTOCK  
PRODUCTION & HEALTH**

**FINAL EXAMINATION**

**NHC2205 FARM MACHINERY & STRUCTURES**

**December 2024**

This examination paper consists of 2 pages

**Time Allowed:** 3 hours  
**Total Marks :** 100  
**Lecturer :** BL Sammie  
**Special Requirements:** Students bring own Calculator

**INSTRUCTIONS**

ANSWER ANY FIVE [5] QUESTIONS. SHOW ALL WORKING FOR CALCULATIONS.

**MARK ALLOCATION**

All questions carry 20 marks

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### Question 1

- a. Explain the importance of proper cleaning, calibration, and maintenance of crop protection and nutrient application equipment to ensure the consistent and safe use of these machines. **[10marks]**
- b. Discuss the potential risks and environmental impacts associated with improper equipment handling and management. **[10marks]**

### Question 2

- a. Discuss any **three [3]** advantages and any **three [3]** disadvantages of using slatted flooring versus solid flooring in swine housing. **[12marks]**
- b. Explain how this choice of flooring can affect animal welfare and the environmental impact of the facility. **[8marks]**

### Question 3

Discuss the potential impact of automation and robotics on the future of farm machinery and farm operations. Your discussion should identify **two [2]** specific applications where these technologies could be advantageous and the challenges associated with their implementation. **[20marks]**

### Question 4

Explain how the combine harvester's design and adjustments can be optimized to minimize fuel consumption and harvesting losses. **[20marks]**

### Question 5

- a. Compare any **three [3]** advantages and **any [3]** disadvantages of a cage-free housing system versus a conventional cage system for laying hens. **[12marks]**
- b. Explain the importance of litter management in a poultry house. **[8marks]**

### Question 6

- a. Describe the **six [6]** essential features and functions of a fertilizer spreader used for applying solid or granular fertilizers. **[12marks]**
- b. Discuss any **four [4]** factors that influence the uniformity and accuracy of fertilizer application when using a spreader. **[8marks]**

**END OF EXAMINATION**