UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: BSC AGRIC II (LWM)

COURSE CODE: LUM 209 (NEW PROGRAMME)

TITLE OF PAPER: FARM BUILDINGS AND STRUCTURES

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER QUESTIONS.

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SECTION I: COMPULSARY

QUESTION ONE

A) Name and briefly describe the functions of any three (3) crop storage structures that are commonly found in Swaziland. **[15marks]**

B) The University Farm Director intends to construct a concrete silage silo with a design life expectancy of 20 years. The depreciation cost is expected to be 5 % per year and the initial costs were estimated to be E5000.00. The bank loan is currently at 17 % interest and an insurance of 1.0 % after construction.

i. Calculate the annual cost of the structure. **[10 marks]**

ii. What would be the value of the structure after the second year of operation? **[10 marks]**

iii. If the returns obtained from silage sales are E900.00 annually, what advice would you give to the farm director and why? **[5 marks]**

SECTION 2: ANSWER ANY TWO QUESTIONS

QUESTION TWO

A) The storage of any agricultural produce can be expensive. Outline the reasons for storage indicating why it is necessary and when it is not beneficial to the farmer. **[15 marks]**

B) Calculate the annual cost of a multi-purpose storage for the second year if it was constructed through a bank loan of E15000.00. The bank interest rate is currently 8.5 %, with an insurance of 1.0 %, maintenance of 0.9 % and an annual depreciation of 2.5 %. **[15 marks]**

QUESTION THREE

A) Name the five (5) types of agricultural fences that are available for use in any given condition. **[10 marks]**

C) Describe how you could construct a barbed wire fence for a livestock (cattle) farm with a total perimeter of 1500 m. Indicate the types of posts and quantities you will use, the height of the fence and the number of wire lines to use as well as the associated spacing. **[20 marks]**

QUESTION FOUR

A) State and briefly describe the **three (3)** types of loads that can be exerted in any agricultural structure. **[6 marks]**

B) Explain the following types of stress and show with the aid of sketches where they may occur in (rural) Buildings:

i. Compression. **[5 marks]**

ii. Tension. **[5 marks]**

iii. Shear. **[5 marks]**

D) A rivert of 10 mm diameter is connecting two pieces of flat steel in a roof tie. Calculate the shear stress of the rivert when the steel bars are subjected to an axial pull of 6.0 kN. **[5 marks]**

C) Why is stress calculation so important in building design? **[4 marks]**