102

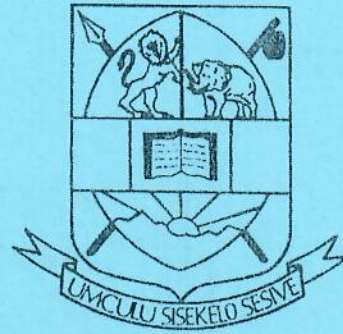## UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER

PROGRAMME: BSc AGRICULTURAL AND BIOSYSTEMS ENGINEERING 2

COURSE CODE: ABE211

TITLE OF PAPER: ANIMAL DRAUGHT IMPLEMENTS

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

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103

SECTION 1: COMPULSORY QUESTION

QUESTION 1

a.   The following data in Table 1 were recorded during field testing of an animal drawn plough.

Table 1: Field test data

Parameter	
Plough width of cut	0.2 m
Draught force reading from pulling chain	1.2 kN
Angle of pull	34°
Distance walked by animals while ploughing	20 m
Time taken by the animals to walk 20 metres	22.2 sec

Using the records given, calculate the following:

i.	Forward speed of the animals in kilometres per hour	[5 marks]
ii.	The drawbar power developed by the animals in kilowatts	[5 marks]
iii.	The area ploughed by the animals in 1 hour (ha)	[5 marks]
iv.	The time required to plough 1 hectare with the draught animals	[5 marks]

Assume 65% efficiency

b.   Your local member of parliament advocates for the use of animal traction instead of tractors on SNL. You have been requested to assist him compile facts in preparation for the on-coming debate in the August house. Discuss five (5) key points that you would suggest to him.
                                                                                        [20 marks]

SECTION II: ANSWER ANY TWO (2) QUESTIONS

QUESTION 2

a. Discuss four (4) characteristics that you would advise farmers to consider when selecting steers for draught work.
                                                                                        [20 marks]

104

b. Name and discuss the design and use of each of the three (3) types of double clamp yokes found in Swaziland   **[10 marks]**

QUESTION 3

a.   Discuss five (5) factors that contribute to reduced interest in the use of draught animal power in Swaziland. In your own opinion, what are the possible options for increasing the use of animal power in the country?   **[20 marks]**

b.   Conformation is often viewed as a key characteristic for selecting draught animals. List and explain cattle conformation features that influence their potential use in draught work .   **[10 marks]**

QUESTION 4

a.   Discuss four (4) factors that determine nutrient requirements of draught animals.
[20 marks]

b.   Name any five (5) animal species used for draught work and indicate the type of work each species is suited for.   **[10 marks]**