



**UNIVERSITY OF ESWATINI
MAIN**

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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SECTION 1: COMPULSORY QUESTION**QUESTION 1**

- 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. 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	0.6 m
Draught force reading from pulling chain	2.2 kN
Angle of pull	35°
Distance walked by animals while ploughing	30 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

SECTION II: ANSWER ANY TWO (2) QUESTIONS**QUESTION 2**

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

QUESTION 3

- a. Discuss three (3) fixed costs associated with using draught animals as a source of power. **[15 marks]**
- b. Discuss three (3) criteria to consider when selecting a mouldboard plough for a pair of oxen **[15 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]**