



**UNIVERSITY OF SWAZILAND**  
**MAIN EXAMINATION PAPER**

**PROGRAMME: DIP IN AGRIC 3, DIP IN AGRIC EDUC 3**

**COURSE CODE: LUM 304**

**TITLE OF PAPER: ANIMAL DRAUGHT IMPLEMENTS**

**TIME ALLOWED: TWO (2) HOURS**

**SPECIAL MATERIAL REQUIRED: CALCULATOR**

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO  
OTHER QUESTIONS.**

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GRANTED BY THE CHIEF INVIGILATOR**

SECTION I: COMPULSORY QUESTION

QUESTION 1

- (a) On what scientific and /or operational principles should draft animals be selected on the bases of their:
- i. Breed,
  - ii. Conformation,
  - iii. Temperament,
  - iv. Age, and
  - v. Weight
- (20 Marks)
- (b) A farmer owns two mature oxen, each weighing 600 kg. When ploughing with a V8 standard animal-drawn plough, the oxen maintain an average walking speed of 0.9 m/s. Each animal pulls at 10 % of its weight. Following advice given by the local agricultural extension officers, the farmer works the animals for a period of five (5) hours in a day. Given that the angle of pull is  $34^\circ$ ,  
Calculate;
- (i) The power generated by the two oxen (5 Marks)
  - (ii) The area ploughed by the oxen per day considering 30% time loss in turning at headlands, resting the animals and routine plough adjustments. (5 Marks)
- (Gravitational acceleration =  $10 \text{ ms}^{-2}$ ).*
- (c) List the steps involved in the training of draught animals. (5 Marks)
- (d) With the aid of a neat sketch diagram of a double neck yoke, explain how you would determine the length of a cultivator yoke for a crop of your choice. Please state the spacing between the crop rows. (5 Marks)

**SECTION II: ANSWER TWO QUESTIONS FROM THIS SECTION**

**QUESTION 2**

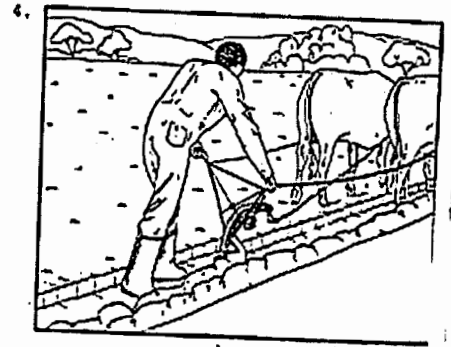
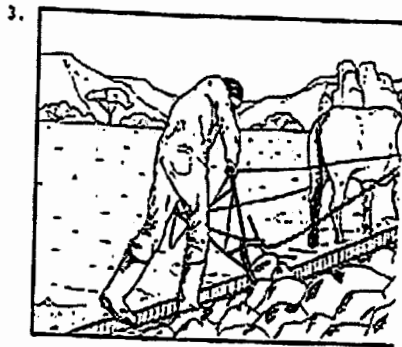
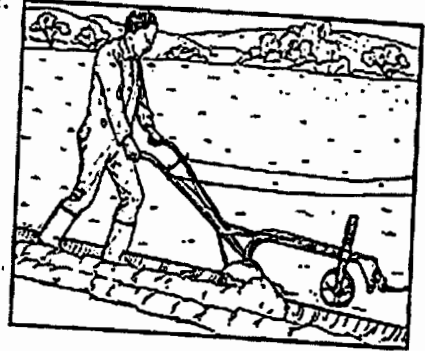
- (a) Explain the procedure for determining the weight of an ox where there are no weighing facilities. (10 Marks).
- (b) What is the most popular breed of cattle used for draught work in Swaziland? What are the characteristics that make it suitable? (10 Marks).
- (c) Define the following terms used in draught animal nutrition:
- (i) Gross energy
  - (ii) Digestible energy
  - (iii) Metabolisable energy
  - (iv) Base metabolism
  - (v) Appetite limit
- (10 Marks).

**QUESTION 3**

- (a) You have been asked by the Dean of Agriculture to buy animal harnesses for the Department of Land Use and Mechanisation. What characteristics /parameters would you consider in the selection of the harnesses? (20 Marks).
- (c) Write advisory notes on good maintenance of draught animals. (10 Marks).

**QUESTION 4**

- (a) State and explain the characteristics of a good animal trainer (8 Marks).
- (b) State **TWO** safety precautions that one needs to take when working with draught animals. (2 Marks).
- (c) Carefully analyse the pictures given below and describe the possible problems that are faced by the ploughman in each situation. Briefly discuss how each situation can be corrected. (10 Marks).



(d) List the signs of good health that you would check on a draught animal (10 Marks).