

2006/2007

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**UNIVERSITY OF SWAZILAND  
SUPPLEMENTARY 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) The government of Swaziland intends to introduce animal traction projects in some of the rural farming communities of the country. You have been hired by the Food and Agricultural Organization of the United Nations (FAO) to conduct a feasibility study in the project areas. The results of your study will be used by FAO in making decision on funding possibilities for the projects. Indicate in bullet points, the factors that you would consider in your study. (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 for a period of five (5) hours. Each animal pulls at 10 % of its weight. Following advice given by the local agricultural extension officers, the farmer supplements the animals with hay of gross energy of 17 MJ. Digestibility of the hay is 85% and 80% of the digestible energy is metabolisable. (*Gravitational acceleration = 10 ms<sup>-2</sup>*)
- Calculate;
- (i) The power generated by the two oxen (5 Marks)
- (ii) The area ploughed by the oxen per hour considering 30% time loss in turning at headlands and routine plough adjustments (5 Marks)
- (iii) The quantity of hay required for the two oxen on each working day. (5 Marks)
- (c) List the steps involved in the training of draught animals. (5 Marks)

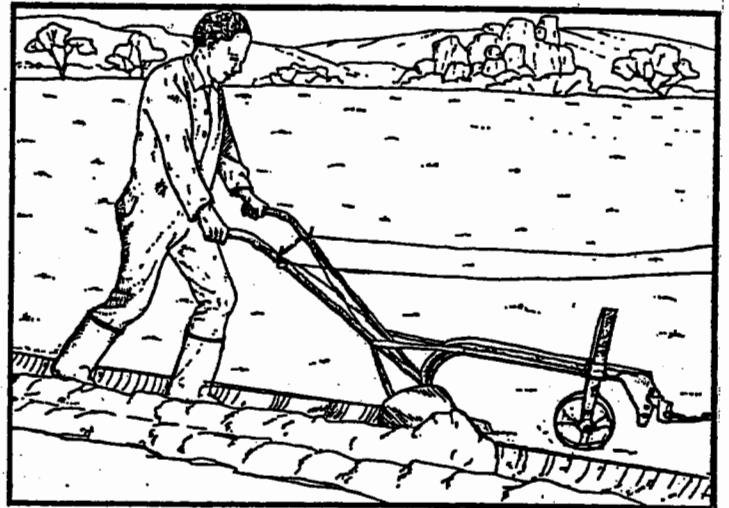
SECTION II: ANSWER TWO QUESTIONS FROM THIS SECTION

**QUESTION 2**

- (a) Briefly describe the factors that are taken into consideration when planning for systematic ploughing with draught animals. (15 Marks)
- (b) What is the most popular breed of cattle used for draught work in Swaziland? What are the characteristics that make it suitable? (7 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. (8 Marks)



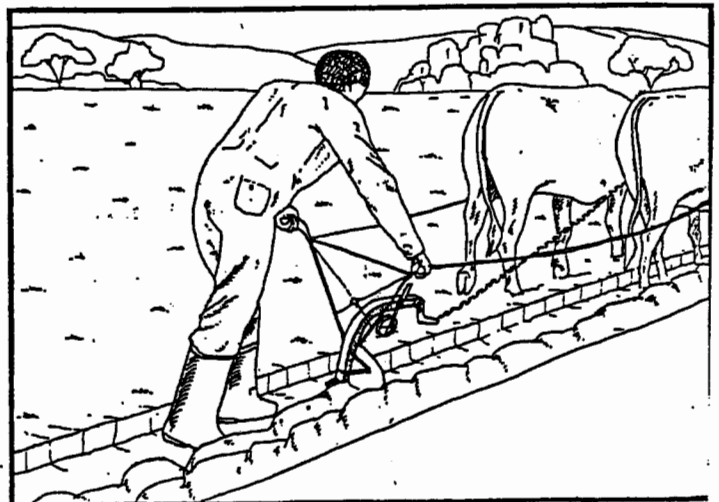
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**QUESTION 3**

- (a) Name **FIVE** animal species used for draught work and indicate the type of work each species is most suited for. (10 Marks)
- (b) List the four major assemblies of an animal drawn plough and briefly explain the functions of each (20 Marks)

**QUESTION 4**

- (a) List and explain cattle conformation features that influence their potential use in draught work. (15 Marks)
- (b) Draw a picture of a bull showing the girth and length measurements. Using the diagram, explain the procedure to determine the weight of the bull. Stipulate the necessary conditions that must be observed to reduce errors of measurement. (15 Marks)