



UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER

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

COURSE CODE: LUM 304

TITLE OF PAPER: DRAUGHT ANIMAL IMPLEMENTS

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

**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) Discuss the desirable characteristics one should consider in choosing a bovine for draught purposes. (20 Marks)
- (b) A farmer owns two mature draught oxen each weighing 600 kg. When pulling a standard animal-drawn plough set at 200 mm width and depth of cut, the oxen maintain an average walking speed of 0.9 m/s for five (5) hours. Each ox can pull 10% of its weight. The farmer supplements the oxen with hay of gross energy of 17 MJ. Digestibility of the hay is 85% and 80% of the digested energy is metabolisable.
- (i) Calculate the power generated by the two oxen. (5 marks)
- (ii) Calculate the area ploughed by the oxen in one hour. Consider 30% time loss in turning at headlands and routine plough adjustments. (5 marks)
- (iii) What quantity of hay is required for the two oxen on each working day? (10 marks)

SECTION II: ANSWER TWO QUESTIONS FROM THIS SECTION

QUESTION 2

- (b) Describe the basic functions of an animal-drawn planter. (10 Marks)
- (b) Why is it necessary to calibrate a planter? (5 Marks)
- (c) The row spacing of maize is 0.9 m and the in-row spacing is 0.25 m. The recommended application rate for basal fertiliser is 300kg/ha. The animal-drawn planter drive wheel circumference is 1.25 m.
- i) Calculate the maize plant population per hectare giving 10% contingency to cater for seed losses due to pests and diseases. (5 Marks)
- ii) Calculate the number of maize seeds that should be dropped after rotating the planter drive wheel 17 times during static calibration. (5 Marks)
- iii) Calculate the amount of fertiliser that should be discharged after rotating the planter drive wheel 17 times during static calibration. (5 Marks)

QUESTION 3

- (a) List the advantages and disadvantages of using animal traction.
(10 Marks)
- (b) Enumerate the different types of draught animals available and state the operations each is suited for. Indicate strengths and weaknesses of each.
(20 Marks)

QUESTION 4

- (a) Write short notes on the following, with respect to draught animals:
- (i) Conformation;
 - (ii) Temperament;
 - (iii) Harness;
 - (iv) Nutrition; and
 - (v) Training
- (15 Marks)
- (b) How would one combat the following diseases?
- (i) Anthrax;
 - (ii) Foot and Mouth Disease;
 - (iii) Brucellosis;
 - (iv) Pasteurellosis; and
 - (v) Rinderpest
- (15 Marks)