



**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

**PROGRAMME: DIPLOMA IN AGRIC. ED. III
DIPLOMA IN AGRIC. III**

COURSE CODE: LUM 301 (OLD PROGRAMME)

TITLE OF PAPER: FARM MACHINERY

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 1

- (a) Briefly outline the operations involved in conventional tillage, indicating their objectives of each operation. [10 Marks]
- (b) Explain why disc ploughs are preferred to mouldboard ploughs in tropical countries. [10 Marks]
- (c) Explain the concept of centre of load and the importance of centre of pull when setting out draught implements for field operations. [10 Marks]
- (d) Write short notes on the following: [10 Marks]
- (i) One-way ploughing; and
 - (ii) Ploughing in lands. [10 Marks]

SECTION II ANSWER ANY TWO QUESTIONS

QUESTION 2

- (a) Explain the reasons for calibrating a machine such as a sprayer. [10 Marks]
- (b) Briefly describe how you would calibrate a boom sprayer. [10 Marks]
- (c) In a calibration exercise, 15L of water was collected from 19 nozzles spaced 50cm apart when the tractor was operating at a speed of 4.8 km/h and had covered a distance of 150m.
- (i) What is the discharge rate?
 - (ii) What is the application rate? [10 Marks]

QUESTION 3

- (a) Briefly discuss THREE functions performed by a maize planter during planting operations.

[15 Marks]

- (b) Why is it important to calibrate a planter?

[5 Marks]

- (c) What are the five methods of planting?

[10 Marks]

QUESTION 4

- (a) What factors influence the performance of field machines

[7 Marks]

- (b) Distinguish between
 i) field capacity
 ii) material capacity
 iii) machine through put

[9 marks]

- (c) A forage harvester was timed during its field operations and the following data was recorded:

Activity	Time taken (min/ha)
1 Turning at headlands	15
2 Unhitching and hitching trailers	15
3 Actual forage harvesting	40
4 Adjusting machine units	15
5 Other down time	25

Calculate the field efficiency of the forage harvester.

[13 Marks]