



**UNIVERSITY OF SWAZILAND  
SUPPLEMENTARY EXAMINATION PAPER**

**PROGRAMME: BSC ABE. II**

**COURSE CODE: ABE 205**

**TITLE OF PAPER: FARM MECHANISATION**

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

**SPECIAL MATERIAL REQUIRED: NONE**

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

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SECTION I COMPULSORY

QUESTION 1

- a) Distinguish between the terms 'implement' and 'machine' as definitions for tools of agriculture. [6 marks]
- b) What are the effects of the following soil properties on the tillage equipment during field operations:
  - 1. Soil strength; [3 marks]
  - 2. Friction characteristics. [3 marks]
- c) Figure 1 shows the components of a mouldboard plough.
  - i) Name the components labelled 2, 4, 8 and 9 [ 8 marks]
  - ii) What are the functions of components 1, 2 and 4 [ 6 marks]

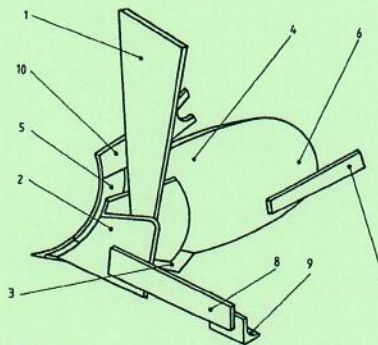


Figure 1. Parts of a mouldboard plough.

- d) Figure 2 shows three types of disc harrows.
  - i) What tasks do disc harrows do during tillage? [8 marks]
  - ii) Name the three types (a), (b), and (c) [6 marks]

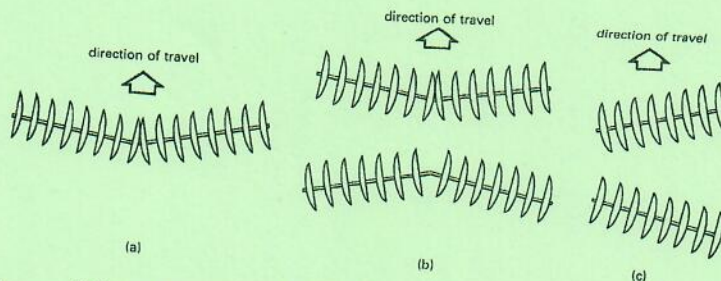


Figure 2. Three types of disc harrows

## SECTION II – ANSWER ANY TWO QUESTIONS

## QUESTION 2

- a) Distinguish between a broadcaster, a seed drill and a precision planter.  
[9 marks]
- b) Disc harrows are used in conservation tillage. What is their role during field operations in minimum tillage?  
[6 marks]
- c) Explain the differences between single acting, offset and tandem disc harrows.  
[15 marks]

## QUESTION 3

- a) Explain the terms 'back furrow' and 'dead furrow' as they arise from ploughing.  
[8 marks]

What are the effects of the presence of the two types of furrows on farming operations?

[7 marks]

- b) The following data were noted during the calibration of a sprayer:
- |                                      |         |
|--------------------------------------|---------|
| Length of run                        | 30 m    |
| Time taken per run                   | 12 s    |
| Spacing between nozzles              | 300 mm  |
| Operating pressure                   | 300 kPa |
| Quantity of sprayer liquid collected | 270 ml  |
| Effective boom width                 | 6 m     |

Calculate

- i) the application rate [8 marks]  
ii) the nozzle discharge [7 marks]

**QUESTION 4**

- a) What is planting? [3 marks]
- b) What factors are influenced by equipment on seed germination and seedling emergency? [12 marks]
- c) Explain the procedure of stationary calibration of a maize planter. [15 marks]