



**UNIVERSITY OF SWAZILAND
SUPPLEMENTART EXAMINATION PAPER**

**PROGRAMME: BSC AGRIC ECON. AGBMGT. II
BSC AGRIC EDUC. II
BSC AGRIC AGRON. II
BSC ANI. SC. II
BSC ANI. SC. (DAIRY) II
BSC HORT. II**

COURSE CODE: ABE 210

TITLE OF PAPER: PRINCIPLES OF FARM MECHANISATION

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 explain any five objectives of tillage. [10 marks]
- b) Cattle are widely used in the SADC region for Draught Animal Power (DAP). What are the advantages and disadvantages of using cattle for DAP? [8 marks]
- c) The power obtained from wind by a windmill is given by the equation

$$P = CD^2V^3$$

Where C = constant

D = diameter of the blades

V = velocity of the wind.

By what ratio is the wind power altered when the wind speed increases from 6 km/h to 8 km/h?

[8 marks]

- d) Discuss the advantages of conservation tillage for small scale farmers in Swaziland. [14 Marks]

SECTION II – ANSWER ANY TWO QUESTIONS**QUESTION 2**

- a) Distinguish between the following farm equipment;
- i) Harrows and cultivators [5 marks]
 - ii) Dusters and sprayers [5 marks]
 - iii) Seed drills and planters [5 marks]

- b) During the static calibration of a single row planter, the following results were obtained;

Measurement	value
Diameter of wheel	40 cm
Row width	90 cm
Number of wheel turns	50
Amount of maize collected	10 kg

Determine the amount of seed that the farmer must buy to plant in a three hectare field.

[15 marks]

QUESTION 3

- a) Use Figure 1 to answer the questions below.
- Name the type of plough
 - Name the components labelled
 - State the functions of the components labelled.

[2 marks]

[4 marks]

[4 marks]

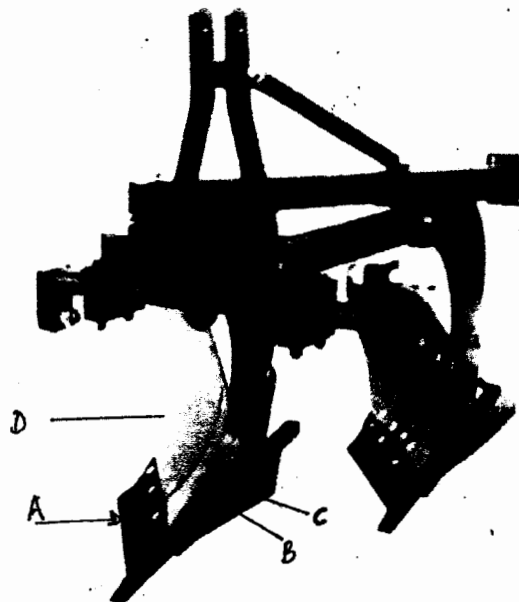


Figure 1 Parts of a 2 bottom mouldboard plough.

b) Figure 2 shows oxen to be selected for Draught Animal Power applications on agricultural farms.

- i. What names describe the backs of the three animals? [9 marks]
- ii. Which back is suitable for draught animal power? [3 marks]

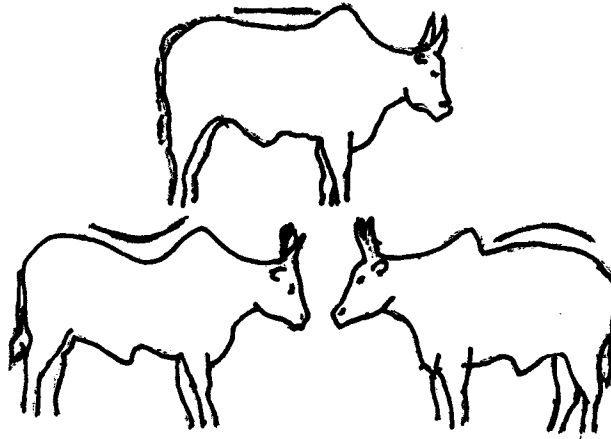


Figure 2 Types of backs of cattle.

c) Figure 3 shows four sets of furrow slices lying at different angles to the furrow bottom.

- i. Which sets of furrow slices are in the recommended lying positions? [4 marks]
- ii. What factors influence the angles of the furrow slices to the furrow bottom? [4 marks]

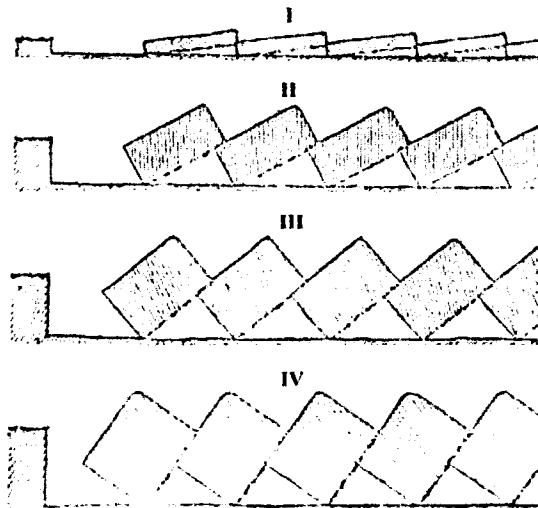


Figure 3 Four furrow slice positions after a mouldboard ploughing operation

QUESTION 4

- a) Renewable energy sources are becoming important components of agricultural energy supplies.
- i. Distinguish between renewable and non-renewable sources of energy. [4 marks]
 - ii. Give four examples of renewable and three examples of non-renewable sources of energy. [7 marks]
- b) “Renewable energy is the most widely used energy by Swazis” .
- i. Do you agree with the above statement? [4 marks]
 - ii. Give reasons/examples for the choice of your answer [6 marks]
- a) Explain the differences between single acting, offset and tandem disc harrows. [9 marks]