UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER

PROGRAMME: BSC AGRIC ECON. AGBMGT. II
BSC AGRIC EDUC. II
BSC 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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SECTION I COMPULSORY

QUESTION 1

a) Figure 1 shows parts of mouldboard plough.

(i) Name the parts labelled.

[6 marks]

(ii) State the functions of the parts

[6 marks]

Figure 1. Parts of a mouldboard plough

b) Briefly explain the three common methods of ploughing

[15 marks]

c) Renewable energy forms part of the sources of energy for agricultural farms. Discuss three common forms of renewable energy and their applications in agricultural enterprises in Swaziland.

[13 marks]

SECTION II ANSWER ANY TWO QUESTIONS

QUESTION 2

a) Figure 2 shows a poor condition of a crop in a field that has been cultivated for several years and has developed a 'plough pan'

i) Explain the term 'plough pan'.

[5 marks]

ii) What other activities on a farm can lead to a condition similar to 'plough pan'?

[5 marks]

iii) Suggest a way of rectifying the situation for the next cropping season so that crops cultivated can be healthy.

[3 marks]

iv) What are the benefits of the method you chose in iii)?

[9 marks]

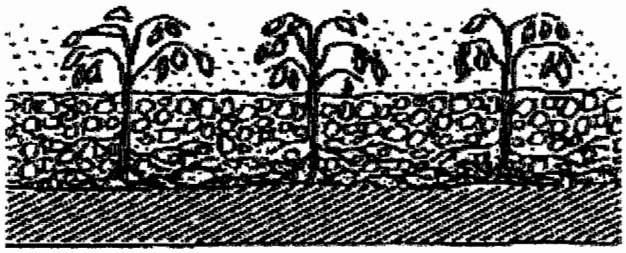

Figure 2 Effect of 'Plough Pan' on crop growth.

b) Distinguish between tractive and stationary farm tasks.

[3 marks]

In each case give five examples of each type of task

[5 marks]

QUESTION 3

a) Explain the procedure of stationary calibration of a maize planter.

[10 marks]

b) During a field calibration of a planter, it is established that 200 seeds are collected from a single row after the planter was moved 50m. An extension officer has recommended a row spacing of 75 cm for maize. Calculate

(i) The plant spacing (intra-row spacing) within a row if each plant-station is to have two maize plants;

[8 marks]

(ii) The plant population (plants per hectare).

[7 marks]

(iii) The crop to be harvested in kg/ha, if a yield of 125 g per plant is expected and an average loss of 10% is assumed.

[5 marks]

QUESTION 4

a) Distinguish between single acting, offset and tandem disc harrows.

[9 Marks]

b) Discuss the benefits of harrowing using disc harrows

[8 marks]

c) Table 1 below shows the times obtained for various activities during spraying with an 18 m boom sprayer.

Table 1. Activity times for spray operations

Activity	Duration (min/ha)
1. Turning at headlands	**6**
2. Refilling spraying tank	**4**
3. Actual spraying	**60**
4. Cleaning clogged nozzles	**5**

Calculate

(i) the field efficiency.

[5 marks]

(ii) the effective field Capacity, if spraying is conducted at 5 kph.

[8 marks]