UNIVERSITY OF SWAZILAND
SUPPLIMENTARY EXAMINATION PAPER

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

COURSE CODE: LUM 301

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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SECTION I: COMPULSORY QUESTION

QUESTION 1

(a)   In planting seeds a planter performs some functions. Briefly discuss **THREE** such functions performed by a maize planter.

(15 Marks)

(b)   Explain why it is necessary to calibrate a planter.

(10 Marks)

(c)   Explain how a rotary cultivator is classified both as a primary and secondary tillage implement/machine.

(10 Marks)

(d)   Why is it necessary to level implements such as ploughs and harrows?

(5 Marks)

SECTION II: ANSWER TWO QUESTIONS FROM THIS SECTION

QUESTION 2

(a)   Define the following psychrometric terms:

(i)   Wet bulb temperature;
(ii)   Humid volume;
(iii)   Specific humidity;
(iv)   Dew-point temperature; and
(v)   Adiabatic process.

(10 Marks)

(b)   Determine the amount of moisture to be removed in drying 4 tonnes of maize initially at 24% moisture content (w.b.) to 13% moisture content (w.b.). Also estimate the weight of the dried maize.

(20 Marks)

QUESTION 3

(a) Briefly outline the operations involved in conventional tillage, indicating the objectives of each operation.

(10 Marks)

(b) Explain why disc ploughs are preferred to mouldboard ploughs in tropical countries.

(10 Marks)

(c) Write short notes on the following:

    (i)   One-way ploughing; and
    (ii)   Ploughing in lands.

(10 Marks)

QUESTION 4

(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)