UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: BSC AGRIC ECON. AGBMGT. II
BSC AGRIC EDUC. II
BSC AGRIC AGRON. II
BSC ANI. SC. II
BSC HORT. II
BSC LWM. II

COURSE CODE: LUM 205 (NEW PROGRAMME)

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)   Explain the meaning of the following terms:

  (i)   Theoretical capacity

[3 marks]

  (ii)   Field capacity

[3 marks]

  (iii)   Material capacity

[3 marks]

  (iv)   Throughput capacity

[3 marks]

b)   List the time elements considered when computing the time efficiency of the use of a machine, and indicate those factors that are considered in calculating the field efficiency.

[13 marks]

c)   A three bottom plough is to be attached to a tractor before setting out to the field. The width of cut per bottom is 45 cm.

  (i)   What is the importance of knowing the centre of load of the plough?

[5 marks]

  (ii)   Calculate the centre of load from the ploughed furrow

[10 marks]

SECTION II – ANSWER ANY TWO QUESTIONS

QUESTION 2

a)   Distinguish between implements, equipment and machines as used in
      farm mechanization terminology.

[9 marks]

b)   Name any six objectives of tillage?

[12 marks]

c)   The reaction of soil to the forces applied by tillage tools depends on
      the following properties: Shear strength of the soil, adhesive
      properties of the soil, and frictional characteristics of the soil.
      What are the effects of these factors in tillage?

[9 marks]

QUESTION 3

a)   Write short notes on
      (i)   The major objectives of plant protection;

[6 marks]
      (ii)   The pros and cons of Ultra Low Volume (ULV) sprayers in
                Swaziland;

[9 marks]

b)   Determine the application rate (in litres per hectare) of a boom sprayer
      that is has a nozzle spacing of 50 cm on an 18 m boom. The sprayer is
      being driven at 8 kph and the nozzle discharge is 0.02 ml per second.

[15 marks]

QUESTION 4

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

                                                                  [15 marks]

b)   A vertical rotor planter has 35 cells around its disc of 28 cm in diameter. The planter's seed tube 70 cm in vertical length and the seed is released 20 cm above the ground from the end of the tube. If the rotor's speed is 25 m/min, and assuming the forward planter speed to be 4 kph and no air resistance, calculate

       (i)   The seed to seed distance along the row;

                                                               [8 marks]

       (ii)   The time required to strike the ground after the seed is released from the rotor.

                                                               [7 marks]