

SUPP.2004/2005

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**UNIVERSITY OF SWAZILAND
SUPPLEMENTARY EXAMINATION PAPER**

**PROGRAMME: BSC AGRIC. 4 (APH)
BSC AGRIC. ED. 4**

COURSE CODE: LUM 401

TITLE OF PAPER: FIELD AND FARMSTEAD POWER

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

QUESTION 1

- (a) Explain why animal draught and manual labour (and not tractor power) are prevalent in African smallholder farming. (20 Marks)
- (b) Solar energy is the most abundant form of energy in the tropics. Briefly discuss the application (and limitations) of solar energy in smallholder farming systems in Swaziland. (20 Marks)

SECTION II: ANSWER TWO QUESTIONS FROM THIS SECTION

QUESTION 2

- (a) Using the annual cost equation, and with the aid of a diagram, explain the determination of the optimum replacement date for farm machinery. (15 Marks)
- (b) Briefly discuss **THREE** factors that affect early replacement of farm machinery. (15 Marks)

QUESTION 3

- (a) With the aid of a diagram, explain how a hydrostatic power transmission system works. (15 Marks)
- (b) Write short notes on the following power transmission systems:
- (i) Gear drives; (5 Marks)
 - (ii) Belt drives; (5 Marks)
 - (iii) Flexible couplings. (5 Marks)

QUESTION 4

(a) Briefly discuss the following with respect to financing and access to agricultural machinery:

- (i) Bank overdraft; (5Marks)
- (ii) Hire purchase; (5Marks)
- (iii) Machinery ring. (5 Marks)

(b) The performance of field machinery is greatly influenced by field efficiency. Briefly discuss the following as they affect field efficiency:

- (i) Crop yield; (5Marks)
- (ii) Soil and crop conditions; (5Marks)
- (iii) Field shape. (5 Marks)