



**UNIVERSITY OF SWAZILAND
EXAMINATION PAPER**

PROGRAMME: BSC AGRIC 4 (LWM), BSC AGRIC 4 (CP)

COURSE CODE: LUM 405 (Old Programme)

TITLE OF PAPER: MECHANISATION MANAGEMENT

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 the concept of selective mechanisation.
(10 Marks)
- (b) Suppose it costs E300,000.00 a year just to own a self-propelled combine harvester (depreciation, taxes, shelter, insurance, interest). A contractor charges E1125.00 per hectare. Assume operating costs at E250.00 per hectare for the combine (tractor, labour, fuel, oil, lubricants, repairs and maintenance). Determine the annual use (ha) that would justify owning the combine harvester.
(10 Marks)
- (b) Explain how the following affect field efficiency:
- (i) Unused machine capacity;
 - (ii) Yield;
 - (iii) Crop and soil conditions;
 - (iv) System limitations;

(20 Marks)

SECTION II: ANSWER TWO QUESTIONS

QUESTION 2

- (a) Explain why it is necessary, when it comes to machinery selection, to treat each farm or situation differently.
(10 Marks)
- (b) Briefly discuss **TWO** factors that may contribute to excessive machinery costs.
(10 Marks)
- (c) Explain how the following increase the optimum power rating of any tractor selected:
- (i) Economic importance of avoiding delays in scheduling (timeliness);
 - (ii) Decreased cost per rated kilowatt;

(10 Marks)

QUESTION 3

- (a) Mechanising small farmers in Africa is fraught with many problems. Briefly discuss **THREE** such problems using Swaziland as an example. (15 Marks)
- (b) Generally, in developing countries, mechanisation benefits large farms. Briefly discuss **THREE** factors that are responsible for this. (15 Marks)

QUESTION 4

- (a) Briefly discuss how the following increase or raise the optimum power rating (when selecting) of a tractor:
- (i) Land area handled
 - (ii) Intensity of mechanical cultivation operations for each hectare
 - (iii) Decreased cost per rated kilowatt
- (15 Marks)
- (b) Explain how the following improve the tractive performance of a tractor:
- (i) Ballasting;
 - (ii) Dual wheels; and
 - (iii) Four-wheel drive.
- (15 Marks)