



1st SEM. 2007/2008

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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME: BSc. in Agricultural Economics and Agribusiness
Management Year II & III**

COURSE CODE: AEM 203

**TITLE OF PAPER: INTRO. TO MATHEMATICS FOR
ECONOMICS**

TIME ALLOWED: 2: 00 HOURS

**INSTRUCTION: 1.ANSWER ALL QUESTIONS
2. EACH QUESTIONS CARRIES 20 MARKS**

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THE CHIEF INVIGILATOR**

Question 1

- a. Use Cramer's rule to find the values of x, y , and that solve the following three equations simultaneously.

$$\begin{aligned} X + Y + Z &= 2 \\ X - Y + Z &= 1 \\ X - Y - Z &= 0 \end{aligned}$$

- b. The income and cost functions of a sugar producer are

$$I(x) = 204x - x^2$$

And $C(x) = x^2 + 4x + 100$ respectively where x is daily production in tons and $I(x)$ and $C(x)$ are measured in E.

- i) For which value of x will the income be maximized?
- ii) Determine the gross profit and the value of x which will maximize the gross profit.
- iii) The producer is taxed at a rate of 45% on the value of x for which it is a maximum. Determine his net profit and the value of x for which it is a maximum.

Question 2

- a) Calculate the definite integrals.

i) $\int (3x^2 + 6x + 1) dx$.

ii) $\int x e^x dx$

- b. The marginal cost function of a producer in terms of production (P) is given by:

$$C'(P) = 2P + P^3 + eP$$

Where the total cost is in E

If the fixed cost $C_F = E100$, find the total-cost function $C(P)$?

Question 3

Given $Q = 200 - 3p + 0.03 Y$, where Q is quantity demanded, p is Price, and y is income, and given $p = 30$ and $y = 4000$

Find ;

- a) the price elasticity of demand. .
- b) the income elasticity of demand.

Question 4

Solve the following differential equations.

a) $y'' + 5y' + 6y = 0$

b) $y'' + 3y' - 4y = 16$

Question 5

Consider the following problem;

Maximize; $Z = 10x + 15y$

Subject to;

$$25X + 50Y \leq 1100$$

$$35X + 30Y \leq 1050$$

$$X, Y \geq 0$$



UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME: BSc IN AGRICULTURAL ECONOMICS AND
AGRIBUSINESS MANAGEMENT YEAR II**

COURSE CODE: AEM 204

TITLE OF PAPER: COOPERATIVES STUDIES

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION: ANSWER ALL QUESTIONS

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QUESTION ONE

You have been promised a job by Imbita, a non-governmental organization that is involved in community development. One of the activities of Imbita is to help farmers to engage in collective action and your task will include advising farmers in this aspect. Identify and discuss the phases involved in forming a cooperative (25 Marks).

QUESTION TWO

- (i) Discuss the major features of cooperatives? (15 Marks)
- (ii) Give and briefly discuss the structural characteristics of cooperatives(10 Marks)

QUESTION THREE

Agricultural co-operatives enable producers to realize economic benefits, which they could not otherwise achieve alone. Identify and discuss these economic benefits (25 Marks).

QUESTION FOUR

"Agricultural cooperatives often fail because of their voluntary nature". Assess the validity of this statement and comment on:

- (i) The causes of failure (15 Marks)
- (ii) The methods to avoid such failures (10 Marks).