MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2013/2014

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF MASTER OF SCIENCE IN AGRICULTURAL
ECONOMICS

(HOMABAY CAMPUS)

AEG 804: OPERATIONS RESEARCH/

AAB 802: DECISION ANALYSYS

Date: 9th August, 2014   Time: 9.00am – 12.00p.m.

INSTRUCTIONS:

- **Answer ALL questions.**

MSc. AGRICULTURAL ECONOMICS

AEG 804: OPERATIONS RESEARCH/AAB: 802: DECISION ANALYSIS

TIME 3 HOURS

INSTRUCTIONS Answer **ALL** Questions

1.

    a. Highlight the characteristics of linear programming problem.   **(10 MARKS)**

    b. Differentiate between decision variable and a constraint.   **(5 MARKS)**

    c. Differentiate between Integer programming and Goal programming   **(4 marks)**

2.

    Discuss the steps involved in an OR study   **(20 MARKS)**

3.

    a. Using suitable illustrations, discuss the problems associated with linear programming. **(12 marks).**

    b. Identify specific areas where linear programming can be important.   **(8 MARKS)**

4.

    a. Using a simplified graphical method, show how the following linear programming problem can be solved   **(10 marks)**

        1. Max $z = 4x_1 + 4x_2$ (0)

        2. S:t: $x_1 + 2x_2 \leq 500$

        3. $X_1 + x_2 \geq 100$

        4. $X_1 : x_2 \geq 0$

    b. Convert the above problem to its dual format   **(5 Marks)**

    c. Convert the restrictions in the above problem into standard form.   **(5 Marks)**

5.

    i. 1000 gm of hot dog mixture requires 2 ingredients; chicken (KES. 3/gm) and beef (KES.5/gm). Recipe requirements are at least 500 gm of "chicken" and at least 200 gm "beef". The ratio of chicken to beef must be at least 2 to 1. Determine optimal mixture of the ingredients that will minimize costs.   **(10 Marks)**

    ii. A manufacturing firm has the following requirements and resource limitations. Using the information, formulate an interger programming problem.   **(10 marks)**

a. Machine shop obtaining new presses and lathes
b. Marginal profitability; each press KES. 100/day; each lathe KES. 150/day.
c. Resource constraints: KES. 40,000 budget, 200 sq. m. floor space.
d. Machine purchase prices and space requirements:-
e.

Machine	Required Floor Space (ft^2)	Purchase Price (KES)
Press	15	8,000
Lathe	30	4,000

6.

a. Monitoring, evaluation and reporting of the implementation of agricultural extension plan is very important in agricultural extension. Discuss the requisites for these processes if an extension project is to be successful. **(20 MARKS)**