MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

THIRD YEAR SECOND SEMESTER EXAMINATION
FOR THE DEGREE OF BACHELOR OF BUSINESS
ADMINISTRATION WITH INFORMATION TECHNOLOGY

MAIN CAMPUS – EDUCATION GROUP

ABA 315: QUANTITATIVE METHODS IN BUSINESS I

Date: 20th June, 2017 Time: 8.30 - 11.30am

INSTRUCTIONS:

- Answer Question ONE and any other THREE
- Question one is 25 marks and the rest 15 marks each

QUESTION ONE (COMPULSORY)

a) Give a graphical sketch of a typical exponential function [6 Marks]

b) Explain business applications that benefit from exponential functions [6 Marks]

c) A country's population grows according to the following functions:

$P_t = P_0 e^{rt}$

Where: P_t = Population at time t

P_0 = Initial population

r = Rate of growth in percentage terms

t = Time

Required:

i). Sketch the population growth curve [3 Marks]

ii). How long will it take for the population to double if r is 1.7%? [5 Marks]

iii). If P_0 = 2,500,000 and r=1.7%, determine the population after 5 years. (5Marks)

QUESTION TWO

a) Using a business example, explain what is meant by Constrained Optimization [5 Marks]

b) A consumer has the following utility function:

$U=xy$

His budget is M=240 and the exogenously determined prices of goods x and y are $Px=2$ and $Py=2$

Required:

i). Set up the consumer budget constraint [2 Marks]

ii). Set up the constrained utility maximization problem for the consumer [4 Marks]

iii). Set up the corresponding lagrangian function [4 Marks]

QUESTION THREE

a) Explain the essence of the Input-Output model in economic analysis [5 Marks]

b) Develop the Input-Output Model assuring a 3-sector economic model [10Marks]

QUESTION FOUR

a) Give a brief history of the development of Linear Programming strategies of resource management [7 Marks]

b) A firm produces two products *X* and *Y* with a contribution of Sh. 80 and Sh. 100 per unit respectively.

Production data are (per unit) :

	Labor Hrs	**Mat. A**	**Mat. B**
x	3	4	6
y	5	2	8
Total available	500	350	800

Required: Formulate the LP model in a standard format [8 Marks]

QUESTION FIVE

a) State the basic properties of a quadratic function [5 Marks]

b) A group of biologists studied the nutritional effects on rats that were fed on a diet containing 10% protein. The protein was made up of yeast and corn flour. By changing the percentage p, of yeast in the protein mix, the group estimated that the average weight gain of a rat over a period of time was given by:

$$g = -200p^2 + 200p + 20$$

Required: Determine the percentage of yeast that gave an average weight gain of 70 grams [10 Marks]