MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

THIRD YEAR SECOND SEMESTER EXAMINATION

FOR THE DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION WITH INFORMATION TECHNOLOGY

CITY CAMPUS - EVENING

ABA 315: QUANTITATIVE METHODS IN BUSINESS I

Date: 9th June, 2017 Time: 5.30 - 8.30pm

INSTRUCTIONS:

- Answer Question ONE and any other THREE.

QUESTION ONE (Compulsory)

a) Give a general sketch of exponential functions [6 Marks]

b) State the general properties of an exponential function [6 Marks]

c) A farmer growing timber knows that the growing value of his timber is given by

$T_t = T_0 e^{rt}$

Where:

T_t = Value of timber at time t

T_o = Value of timber at t=o

r = Rate of growth of value of timber in percentage terms

t = Time

Required:

i). Find the value of timber 15 years from now, given that r=2.3% and To = Sh. 2,500 [6 Marks]

ii). At a growth rate of 2.3% over what period of time will the value of timber be 5 times the initial value? [7 Marks]

QUESTION TWO

a) Explain the essence of Constrained Optimization in Business Management [4 Marks]

b) Consider the following constrained optimization problem:

Optimize $Z = 2x^2 + 2xy + 4y^2$

Subject to: $4x + 4y = 32$

Required:

i). Set up a lagrangian function for the above problem [3 Marks]

ii). Find the critical values of x, y and v [6 Marks]

iii). Find the extreme value of Z [2 Marks]

QUESTION THREE

a) State the basic assumptions of the Input-Output model [5 Marks]

b) Develop the Input-Output Model for a three sector economy system [10 Marks]

QUESTION FOUR

a) What are the essential characteristics of problems that can be solved by Linear Programming methods? [7 Marks]

b) A factory produces four products A, B, C, and D which earn contributions of Sh. 20, 25, 12 and Sh. 30 per unit respectively. The factory employs 500 workers who work a 40 hour week. The hours required for each product and the material requirements are set out below:

	A	B	C	D
Hours per unit	6	4	2	5
Kg. Mat x pu	2	8.3	5	9
Kg. Mat y pu	10	4	8	2
Kg Mat z pu	1.5	-	2	8

The total availability of mat per week is:

x – 100,000 Kgs

y – 65,000

z – 220,000

Required: Formulate the LP is a standardized manner [8 Marks]

QUESTION FIVE

a) State the major properties of quadratic functions [5 Marks]

b) The profit of a company is given by the following equation:

$\pi = -56000 + 1200p - 4p^2$

Required:

i). Sketch the company's profit graph [4 Marks]

ii). Determine the price of the product when $\pi=0$ [6 Marks]