



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2016/2017

SECOND YEAR FIRST SEMESTER EXAMINATION FOR
DIPLOMA IN BUSINESS ADMINISTRATION

CITY CAMPUS- DAY

ADB 0164: QUANTITATIVE TECHNIQUES

Date: 25th November, 2016

Time: 2.00 – 5.00pm

INSTRUCTIONS:

- Answer Question ONE and any other TWO.



QUESTION ONE (30 MARKS)

- a) Define Calculus (2marks)
- b) Explain the meaning of the following terminologies as used in inventory control management;
- i. Lead time (2mks)
 - ii. Re - Order Level (2mks)
 - iii. Demand (2mks)
- c) Define the following terms as used in Decision Making;
- i. Decision Maker (2mks)
 - ii. Events/States of Nature (2mks)
 - iii. Pay - Off (2mks)
- d) Calculate the integer of the equation; $y = 2x^3 + 3x^2 - 12x + 4$ (6mks)
- e) Shell Limited is considering acquiring Kobil Limited. The projected net profits of Kobil Limited as a function of time is given as $y = 20 + 12x - x^2$; where y = net profit in Kshs and x = time in years.
The acquisition by Shell limited is based on the total anticipated profits of Kobil Limited during the second and the fifth year after acquisition. What is the value of the acquisition bid? (10mks)

QUESTION TWO (20 MARKS)

Two components of a product X & Y are used during a company's manufacturing process as follows:

Normal Usage	120 Units per week each
Minimum Usage	60 Units per week each
Maximum Usage	180 Units per week each
Re-ordering quantity	A- 2000 Units ; B-3200 Units
Re-ordered period	A- 6 to 10 weeks; B-4 to 8 weeks

Required

For each component X and Y, calculate:

- | | |
|-------------------------|--------|
| a) Re-ordering level; | (5mks) |
| b) Minimum level; | (5mks) |
| c) Maximum level; | (5mks) |
| d) Average stock level. | (5mks) |

Also on the difference in the levels for the two components, comment briefly.

QUESTION THREE (20 MARKS)

A businessman has three alternatives open to him each of which can be followed by any of the four possible events. The conditional pay-offs (in shs) for each action – event combination are given below;

Alternative	Pay-Offs conditional on Events			
	A	B	C	D
X	8	0	-10	6
Y	-4	12	18	-2
Z	14	6	0	8

His degree of optimism is 0.6

Determine the alternative which the businessman should choose if he adopts;

- a) Maximin Criterion (4mks)
- b) Maximax Criterion (4mks)
- c) Hurwicz Criterion (4mks)
- d) Laplace Criterion (4mks)
- e) Minimax Regret Criterion (4mks)

QUESTION FOUR (20 MARKS)

In a certain Country there are two daily newspapers, Taifa Leo and the Standard. A researcher who is interested in the reading habits of this country's citizens found the following;

- Of the readers who read Taifa leo on a given day, 50% do so the following day.
- Of those who read the Standard on a given day, 40% change to Taifa Leo the following day.

Yesterday the readership levels were 30%Taifa Leo and 70% Standard. Assume all conditions hold;

- a) Determine the readership levels of both dailies
 - i. Today (3mks)
 - ii. Tomorrow (3mks)
- b) If this process persists long enough, determine the readership at the equilibrium state. (10mks)
- c) State the assumptions of Markov's process (4mks)