



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2012/2013

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE DIPLOMA IN BUSINESS ADMINISTRATION (CITY CAMPUS)

ADB 0164: QUANTITATIVE TECHNIQUES

Date: 19th July, 2013

Time: 2.00 – 4.00 p.m.

INSTRUCTIONS:

1. Attempt Question ONE and any other TWO questions.
2. Question one carries 30 marks, the rest 20 marks each.

QUESTION ONE (30 MARKS): COMPULSORY

- a) i) What are quantitative techniques? (2 marks)
ii) Explain the roles of Quantitative Techniques in business and industry today. (8 marks)
- b) Find out the derivatives of the following functions (3 marks)
- i. $y = 3x^2 + 5x$ (3 marks)
- ii. $y = \frac{x^3 + 3x^2 + 3}{2x}$ (5 marks)
- c) Solve the following simultaneous equations using matrix algebra (6 marks)
- $$\begin{aligned} 5x + 9y &= -30 \\ 6x - 2y &= 28 \end{aligned}$$
- d) Company A is considering making a bid for company B. The anticipated net profits of company B as a function of time is
- $$y = 20 + 12x - x^2$$
- Where y = net profit in (£ 000s) and x =time (in years)
The bid by company A is to be based on the total anticipated profits of company B during the second to sixth year after takeover. What is the value of the bid? (6 marks)

QUESTION TWO (20 MARKS)

- a) What do you understand by the term inventory control? Explain the benefits of an inventory control system. (7 marks)
- b) i.) Distinguish between maximum stock level and minimum stock level. (4 marks)
- ii.) Describe Economic Order Quantity (EOQ), clearly illustrating, with the help of a well labeled diagram, the relationship between factors that determine EOQ. (6 marks)
- c) Satyam, a machine manufacturer, purchases 3 600 units of a certain component for his annual usage. The order placing cost is Ksh. 2 000 and cost of carrying one unit for a year is Ksh. 40. Calculate the EOQ. (3 marks)

QUESTION THREE (20 MARKS)

a) Explain the various assumptions of linear programming. (10 marks)

b) A sales manager has to assign salesmen to four territories. He has four candidates of varying experiences, capabilities and assesses the possible profit potential of each salesman for each territory given below.

Profit potential in				
Territories				
Salesman	A	B	C	D
1	35	27	28	37
2	28	34	29	40
3	35	24	32	33
4	24	32	25	28

Find the assignment which maximizes profit. (10 marks)

QUESTION FOUR (20 MARKS)

a) Briefly explain the following principles employed during decision making under uncertainty.

- i. Maximin or minimax principle.
- ii. Maximax or minimin principle.
- iii. The Hurwicz principle.
- iv. The minimax regret principle.

(12 marks)

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

Alternative	Payoffs conditional on events			
	A	B	C	D
X	10	0	-12	8
Y	-6	14	20	-4
Z	16	6	0	10

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

- i. Minimax criterion.
- ii. Maximax criterion.

(8 marks)

QUESTION FIVE (20 MARKS)

A distribution system has the following constraints:

Factory	Capacity (in units)
A	45
B	15
C	40
Warehouse	Demand (in units)
I	25
II	55
III	20

The transportation costs per unit (in shillings) allocated with each route are as follows:

		To (warehouse)		
		I	II	III
From (Factory)	A	10	7	8
	B	15	12	9
	C	7	8	12

Find the optimal transportation schedule using the Vogel's Approximation method.
(20 marks)