



KABARAK

UNIVERSITY

UNIVERSITY EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: FNCE 212

COURSE TITLE: MANAGEMENT MATHEMATICS II

STREAM: Y2S1

DAY: FRIDAY

TIME: 8.30 – 10.30 A.M

DATE: 8/8/2008

INSTRUCTIONS:

1. Answer question **ONE** and any **Other Two**
2. Financial tables and formulae are provided
3. All working leading to answers must be clearly shown

PLEASE TURN OVER

QUESTION 1: (Compulsory) (40 marks)

- (a) What are the **SIX** steps that one has to go through when formulating a linear programming mathematical model? **(6mks)**
- (b) The Rift Valley Textiles (RIVATEX) is considering introduction of a new product with new packaging to replace the existing product at a much higher price (S_1) or a moderate change in the composition of the existing product with a new packaging at a small increase in price (S_2) or a small change in the existing product except with the word 'new' with a negligible increase in price (S_3). The three possible status of nature are: High increase in sales (N_1) no change in sales (N_2) and decrease in sales (N_3) for all of the alternatives respectively. The marketing department of the RIVATEX worked out pay offs in terms of these event as presented below pay offs for expected sales volume.

Strategies		Expected sales in KSH '000		
		N_1	N_2	N_3
S_1		70	30	15
S_2		50	45	0
S_3		30	30	30

Based on the payoff above what alternative should the marketing manager choose if he is: an optimist, Pessimist and if he has a level of optimum $a=0.4$ **(12mks)**

QUESTION 2

- (a) The proprietor of a stationary shop has to decide on the number of packets of new years greetings cards to order for 2004. His present ten year records indicate the following:

Sales (packets)	No. of years	Probability
200	2	0.2
300	3	0.3
400	3	0.3
500	1	0.1
600	1	0.1
TOTAL	10	1.0

Each packet of cards cost him Ksh 20 and he sells for Ksh 30. An unsold packet at the end of January 2005 fetches for Ksh 5 only. Using the Maximum Expected Monetary Value (EMV), how many packets should he order for 2004?

(12mks)

- (c) A person lends Ksh 10,000 to a corporation. Simple interest is computed quarterly at a rate of 12%p.a. Interest is paid quarterly to the person if the period is 5 years and the final amount includes the original principal, plus interest earned during the last quarter. Compute the interest earned in each quarter and the total interest that will be earned over 5 years.

(3mks)

QUESTION 3

- (a) John James recently won a lottery. The terms of the lottery are that James will receive annual payments of Ksh 20,000 at the end of this year. If James was to invest the money today at a rate of 8% p.a compounded annually, what is the present value of all payments?

(10mks)

- (b) Discuss the **FIVE** basic assumptions of linear programming

(5mks)

QUESTION 4

- (a) In an economy made up of three sectors, that is the Manufacturing (X), Agriculture (Y) and Service (Z) sectors. The contribution from the three sectors to the Gross Domestic Product has been hypothesized with the following three equations:

$$3x - 2y - z = 2$$

$$-4x + y - z = 3$$

$$2x + z = 1$$

Use matrix method (use either inverse or Cramer's Rule) to solve for X, Y, & Z contributions.

(9mks)

- (b) Assume that an investment of Ksh 100000 is made. This earns interest at the rate of 6%p.a. If all interest is re-invested what will be the value of the investment after 5 years if interest is compounded: Semi-annually, quarterly and Monthly.

(6mks)

- (c) Two brands of A and B sports kits each consists of a shirt, pair of shorts and socks. The costs of brand A are Kshs 690 for the shirt, Ksh 474 for the short, Ksh 222 for socks. The costs of brand B are Ksh 750 for the shirt, Ksh 538 for the short, Ksh 236 for socks. Three customers X, Y, and Z demand the following combination of brands:

X: 36 kits of A and 48 kits of B

Y: 24 kits of A and 72 kits of B

Z: 60 kits of A

Express the costs of brand A and B in matrix form, then the demands of customers X, Y and Z also in matrix form. Deduce the total cost to each of the customers. **(10mks)**

- (d) A lump sum of money is invested at rate of 10% p.a compounded quarterly. How long will it take if the investment to double and triple? **(4mks)**
- (e) Two T.V. stations Nation and K.T.N (N and K) compete for viewers, out of those who view N on a given day 40% view K the next day. In the case of those who view K on a given day, 30% switch to N the next day. Suppose yesterday, of the total viewers 60% viewed N and the rest K, determine the percentage of viewers for each station today, tomorrow and in the long run or equilibrium state. **(8mks)**