KABARAK **UNIVERSITY**

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE*:*   **FNCE 212:**

COURSE TITLE*:*   **MANAGEMENT MATHEMATICS II**

STREAM: **Y1S2**

DAY: **TUESDAY**

TIME: **8.30-10.30 A.M.**

DATE: **18/12/2008**

INSTRUCTIONS:

   i.   *Answer Question **One** and any **Other Two** questions*
   ii. *All workings leading to answers must be clearly shown*

PLEASE TURN OVER

QUESTION ONE: (40 Marks)

a)   Discuss any three assumptions of the input – output analysis   **(6mks)**

b)   Assume that an investment of Kshs 100000 is made. This earns interest at the rate of 5%. If all interest is re invested, what will be the value of the investment after 5yrs if the interest is compounded

$$\quad\text{i.}\quad \text{Annually}$$
$$\quad\text{ii.}\quad \text{Semi-annually}$$
$$\quad\text{iii.}\quad \text{Quarterly}\qquad\qquad \textbf{(6mks)}$$

c)   The following matrix of transition probabilities relate to a market dominated by two firms

$$T = \begin{bmatrix} 0.70 & 0.30 \\ 0.25 & 0.75 \end{bmatrix}$$

Assume that brand 1 currently has 70% of the market share and brand 2 has the remaining 30%. Predict the market share

i.   in the next period ;

ii.   after four periods; and

iii. at the steady state   **(6 mks)**

d)   A couple just had a new child. How much should they invest now at a rate of 8% compounded yearly to have Kshs. 400 Million for the child's education 17 yrs from now?   **(3mks)**

e) An investor has an opportunity to purchase two different notes: Note A pays 15% compounded monthly, and Note B pays 15.2% compounded semi-annually. Which is the better investment assuming all else equal?   **(4 Mks)**

f)   solve the following simultaneous equations

$$3x - 2y + 4z = 4$$
$$4x + y - 5z = 2$$
$$-6x + 4y - 8z = -2 \qquad\qquad \textbf{(6Mks)}$$

g) An enterprising student at Kabarak University has decided to purchase a local Hotel business at Kambi Moto. The purchase price is Kshs. 450,000. The Hotel cleaning will be priced at Kshs. 50 and variable cost per car is expected to be Kshs. 20. How many cars must be washed in order to recover the Kshs. 450, 000? **(4Mks)**

h) Distinguish between the following paired concepts

i.	Identity Matrix and Diagonal Matrix	**(2 Mks)**
ii.	Row Matrix and Vector matrix	**(2Mks)**
iii.	An annuity and mortgage	**(1 Mk)**

QUESTION TWO (OPTIONAL)

a) Explain any four managerial uses of Markov process **(4Mks)**

b) Winnie is an intelligent student and usually makes good grades provided that she has the chance to review the course material the night before the exam. For tomorrow's exam, Winnie is faced with a small problem. Her brothers are having an all night party in which she would like to participate. She has three (3) options. Namely a_1 = Party all night, a_2 = divide night equally between studying and partying and a_3 = study all night. The Lecturer who is giving tomorrows exam is unpredictable in the sense that the test can be easy (s_1), moderate (s_2) and tough (s_3). Depending on the toughness of the test and amount of review Winnie does, the following test score combinations are anticipated.

		i. S_1	S_2	S_3
b.	a_1	85	60	40
c.	a_2	92	85	81
d.	a_3	100	88	82

Recommend a course of action for Winnie based on the four criteria of decisions under uncertainty ($\alpha = 0.6$). **(12 Mks)**

c) 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.

(4 Marks)

QUESTION THREE (20 Marks)

a) Discuss the **FIVE** basic assumptions of linear programming.   **(5 Marks)**

b) Scientists have been studying the migration habits of a particular species of wild animals. An annual census was conducted in three different regions inhabited by the species. A stable pattern of changes has been observed in their movements. This is reflected in the following transition matrix.

	To region		
	1	2	3
1	0.9	0.05	0.05
From 2	0.1	0.8	0.1
3	0.05	0.1	0.85

Assume the population of the three regions were 40,000, 20,000, and 30,000 respectively for regions 1, 2, and 3 during the last census. Predict the population of each region at the time of the next census two (2) years from now.   **(5Mks)**

c) 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 Ksh20 and he sells for Ksh30. An unsold packet at the end of January 2005 fetches for Ksh5 only. Using the Maximum Expected Monetary Value (EMV), how many packets should he order for 2004?   **(10 Mks)**

QUESTION FOUR (OPTIONAL)

a) What are the steps followed during decision making process   **(6 Marks)**

b) Economic Women Caucus (EWC) prepares two products Ciondo and Curios for export market. The two products support each other to ensure prompt satisfaction for any demand. Last consignment was worth Kshs. 80 million of Ciondo and Kshs. 100 million of Curios. The support that was given to prepare Ciondo was worth Kshs. 20 million of Ciondo and Kshs. 10 million of Curios. The support for the Curios was Kshs. 15 million of Ciondo and Kshs. 30 million of Curios. EWC now has another order worth Kshs 100million of Ciondo and Kshs. 120 million of Curios.

 Required:

 i Determine the total worth of Ciondo and Curios that should be prepared to satisfy the order.

 ii Distribute the totals obtained in (a) above to the appropriate purposes. **(14Mks)**