KABARAK   **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: THURSDAY

TIME: 9.00 – 11.00 A.M.

DATE: 26/03/2009

INSTRUCTIONS:

i.   *Answer Question **One** and Any **Other Two***
ii.   *All Workings Leading to Answers Must Be Clearly Shown*

PLEASE TURN OVER

QUESTION ONE: (Compulsory) (30 Marks)

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

b) 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)

c) Cynthia 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, Cynthia 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 Cynthia does, the following test score combinations are anticipated.

	S_1	S_2	S_3
a_1	85	60	40
a_2	92	85	81
a_3	100	88	82

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

d) Write short notes on the following terms

     i.   Markov process

     ii.   Transition matrix

     iii.   Initial state probability

     iv.   Decision under certainty

     v.   Decision under uncertainty   (5 Mks)

e) Solve the following Linear programming Equations using the graphical method

    Maximize $Z = 5x_1 + 6x_2$

   Subject to

        $3x_1 + 2 x_2 \leq 120$

        $4x_1 + 6x_2 \leq 260$

        $X1, x2 \geq 0$ (4Mks)

QUESTION TWO (20 Mks)

a) The following matrix illustrates the transition probabilities associated with a market dominated by three brands

$$T = \begin{bmatrix} 0.2 & 0.6 & 0.2 \\ 0.1 & 0.5 & 0.4 \\ 0.2 & 0.3 & 0.5 \end{bmatrix}$$

Assume brand 1 currently has 40% of the market, brand 2 has 40% of the market and brand 3 has 20%. Predict the market shares after

    i.   The next period

    ii.   The next 3 periods

    iii.   In the long run   (9 Mks)

b) A person estimates that he can afford a mortgage payment of Kshs. 12,000 per month. He can obtain a 30 year mortgage at an interest rate of 12%. What is the largest mortgage he can afford?   (5 Mks)

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

QUESTION THREE (20 Mks)

a) A lump sum of money is invested at a rate at 10% p.a. compounded quarterly. How long will it take the invested to

    i.   Double   (3Mks)

    ii.   Triple   (3 Mks)

b) Solve the following equations by the use of the inverse method.

$$X + 2y + z = 8$$
$$2x + 3y + 2z = 14$$
$$3x + 2y + 2z = 13$$
          (10 Mks)

c) An investment offers a fixed rate of interest of r% per annum over five years. Consider investing $10000 now in order to accrue $20000 at the end of the period. Calculate r

          (4 marks).

QUESTION FOUR (20 Mks)

a) 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)

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

c) Discuss any four basic assumptions of linear programming.   (4 Marks)

d) 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?   (8 Mks)