

KABARAK



UNIVERSITY

**UNIVERSITY EXAMINATIONS
2009/2010 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF
COMMERCE**

COURSE CODE: FNCE: 212

COURSE TITLE: MANAGEMENT

MATHEMATICS II

STREAM: Y2S1

DAY: TUESDAY

TIME: 9:00 – 11:00 A.M.

DATE: 23/03/2010

INSTRUCTIONS:

1. This paper contains FIVE questions. ANSWER ANY FOUR
2. All questions carry equal marks. Marks for each selection are shown.
3. Tables and formulae are provided

PLEASE TURNOVER

QUESTION 1

- a) Explain any of the assumptions made when using each of the following and show what will happen when these assumptions do not hold.
- (i) Markov Chains. (4 marks)
 - (ii) Input-Output analysis. (4 marks)
- b) The total number of people who shop in supermarkets in Nakuru is 32,000. A survey conducted by a Kabarak university student two weeks ago established that 12,000 of these people shopped at Rongai Mattresses (RM), 10,000 shopped at Duka Letu (DL) Mattresses and the rest at London Kenya (LK) stores. A week ago the following patterns was reported: of those who shopped at RM two weeks ago, 2,000 defected to at DL, 1,000 defected to LK while the rest remained loyal to RM. Of those who shopped at DL two week ago 3,000 defected to RM, 2,000 to LK while the rest remained loyal. Of those who shopped at LK two weeks ago 500 defected to RM, 1,500 to DL while the rest remained loyal. Assume the patterns will continue into the foreseeable future.

Required:

- (i) Determine the proportion of these customers who will be expected to shop in each of the supermarkets once the system stabilizes. (12 marks)
- (ii) Assuming the average monthly spending by these shoppers is Kshs.22, 500 what will be the expected annual revenues of these supermarkets in the long-run? (5 marks)

QUESTION 2

- a) Explain the following terms:
- (i) NPV
 - (ii) Compound interest
 - (iii) Simple interest
 - (iv) Annuity. (8 marks)
- b) A certain farmer in Machakos harvested 100 bags of maize. If the selling price is projected to be Kshs. 1,000, Kshs.2,000 and Kshs.3,000 per bag for the next three years respectively. What are his present values given the discount rate 10%? (9 marks)
- c) Discuss any two advantages and two disadvantages of Linear Programming. (8 marks)

QUESTION 3

- a) Using appropriate examples explain the following:
- (i) Mutually exclusive events
 - (ii) Joint probability
 - (iii) Empirical approach to probability
 - (iv) Bayes Theorem. (4 marks)
- b) There are 100 students in first year at Prestige University, 36 are male and are studying Accounting, 9 are male and are studying Finance, 42 are female and are studying Accounting while 13 are female and are studying Finance.

Required:

1. What is the probability that a student picked at random is a;
- (i) Male
 - (ii) Female
 - (iii) An Accounting student
 - (iv) A finance student
2. What is the probability that a student picked at random is:
- (i) A male and is studying Accounting
 - (ii) A male is studying Finance
 - (iii) A female and is studying Accounting
 - (iv) A female and is studying Finance. (13 marks)
- c) Discuss the two major approaches used to assign probabilities giving an example of each. (8 marks)

QUESTION 4

- a) Using appropriate examples explain the following as used in decision theory.
- (i) Decision making under uncertainty
 - (ii) Decision making under risk
 - (iii) Decision making under competitive environment. (6 marks)
- b) Explain the steps followed in decision-making. (7 marks)
- c) Nyanyuma is considering investing in real estate through an apartment building, an office building or a warehouse. The following matrix shows her payoffs.

Decision	States		
	Good (Shs. 000)	Fair (Shs.000)	Poor (Shs. 000)
Apartment	5,000	3,500	1,500
Office	8,000	6,000	-2,000
Warehouse	3,000	4,000	1,000

Required:

On the basis of each of the following criteria, advice Ms.Nyanyuma (where appropriate assume $\alpha = 0.55$)

- (i) Maximax
- (ii) Maximin
- (iii) Realism. (12 marks)

QUESTION 5

- a) Indicate whether the following statements are TRUE or FALSE.
 - (i) It is possible to multiply matrix $A_{3 \times 5}$ and $(B_{2 \times 5})^T$
 - (ii) A steady state of a Markov process change as loyalty continues to occur.
 - (iii) It does not matter the order in which you multiply two matrices, the product matrix will always be the same.
 - (iv) In the input-output model, the total of dependent and external demand is one.
 - (v) In establishing the technological matrix of an economy, all sectors must produce the same output.
 - (vi) The major limitation of input-output model is that it assumes constant returns to scale.
 - (vii) Simple interest computation assumes that interest increases at an increasing rate.
 - (viii) Matrices provide a convenient technique of storing and manipulating data using various operations. (8 marks)
- b) The following table gives the input-output coefficients for a three sector economy consisting of Manufacturing, mining and Construction.

From	To		
	Manufacturing	mining	services
manufacturing	0.3	0.4	0.2
Mining	0.2	0.0	0.5
services	0.1	0.3	0.1

The project forecast demand for the three sectors is 100, 40 and 50 million shillings. Determine what gross outputs of the three sectors will meet this demand. (11 marks)

- c) Discuss any three assumptions of linear programming. (6 marks)