UGANDA MARTYRS UNIVERSITY

FACULTY OF BUSINESS ADMINISTRATION AND MANAGEMENT

UNIVERSITY EXAMINATION

SEMESTER TWO 2013/2014

FIRST YEAR EXAMINATION FOR BACHELOR OF BUSINESS ADMINISTRATION AND MANAGEMENT

QUANTITATIVE METHODS

DATE:

TIME: 3 HOURS

Instructions:

i. Attempt question any four question

ii. Show all workings and they have to be clear and tidy

QUESTION ONE

a) $3x_1 + 2x_2 - x_3 = 2$

$2x_1 - x_2 - 3x_3 = 13$

$x_1 + 3x_2 - 2x_3 = 1$

Find the values of x_1 , x_2 and x_3 in the equation using matrix system **(12 marks)**

b. A company with four retail stores has 35 TVs , 60 Stereos x_2, 55 VCRs and 45 Camcorders in store A; 80 TVs , 65 Stereos, 50 VCRs and 38 Camcorders in store B; 29 TVs , 36 Stereos, 224 VCRs and 32 Camcorders in store C; 62 TVs , 49 Stereos, 54 VCRs and 33 Camcorders in store D.

i. Express the present inventory in an equation form and derive a matrix out of the equation **(5 marks)**

ii. In the (b) above, if the price of a TV is Shs. 400,000, Stereo Shs. 300,000, VCR Shs. 250,000, Camcorder Shs. 500,000. Use vector multiplication to find the value of stock A, B C and D. **(8 marks)**

QUESTION TWO

A Commercial Bank is worried about its market share because of a new comer in providing a particular type of service, its facing heavy competition from two well-known old timers. refer to the Commercial Bank as A and its rivals as B and C. assuming that the brand switching data showing the flow of customers among the three competitors has been availed to you as in the following table:

			Gains from:			Losses to:				
			A	B	C	A	B	C		
Company	No. of customers as at 1st June	Market share							No. of customers as at 1st July	Market share
A	X		0	12	20	0	15	9	212	
B	Y		15	0	5	12	0	7	417	
C	Z		9	7	0	20	5	0	522	

i. Complete the flow chart **(5 marks)**

ii. Obtain the matrix of transition probabilities **(6 marks)**

iii. Specify what the rows and columns represent **(4 marks)**

iv. Predict the market share as at 1st August and 1st September **(6 marks)**

v. Suggest what firms should do to improve their market share **(4 marks)**

QUESTION THREE

a) What is meant by objective function in Linear Programming model? **(1 mark)**

b) What is a constraint? Give two examples of constraints in real life situations. **(2 marks)**

c) Define the feasible area.**(1 mark)**

d) Coca Cola Company has 300 ml and 1500 ml canned cola as its products with profit margin of Shs. 400 and Shs. 750 per unit respectively. Both the products have to undergo process in three types of machine.

The following Table, indicates the time required on each machine and the available machine-hours per week

Available data

Requirement	300 ml Can	1500ml Can	Available machine hours per week
Machine I	3	2	300
Machine II	2	4	480
Machine III	5	7	560

i. Formulate the linear programming problem. **(5 marks)**

ii. Specify the product mix which will maximize the profits within the limited resources using the Graphical Method. **(13 marks)**

iii. Using relevant examples explain 3 ways how coca cola can maximise its profits in the production process.**(3marks)**

QUESTION FOUR

As the financial accountant in your company, you provide advice to staff on a range of financial issues.

Advise your staff on the following:

(a) Jane Kevin is new graduate with a new job. How much money should she save at a return of 6% so as to pay her for her Master' degree course tuition fee of shs.15, 000,000 in the next 4 years?

i. Compound semi-annually **(3 marks)**

ii. Annually **(3 marks)**

b) Your colleague in the accounts department wishes to purchase furniture for her apartment. She has been offered a fixed deposit savings account at an interest rate of 15% over an 8-months term. She states that she can afford to save Shs. 1,400,000 per month. What will be the value of her account after 8 months? **(4 marks)**

c) DIY Ltd. is investing in a new branch to one of its factories. The cost of construction now is €50,000; €30,000 will be invested in equipment in 12 months' time and a further €8,000 at the end of 2 years. The management accountant estimates that the cash inflows will commence at the end of year 3 and will continue as set out in the following schedule. The residual value of the equipment at the end of year 7 is €10,000.

Year	3	4	5	6	7
Cash flows	30,000	30,000	30,000	30,000	20,000

The cost of borrowing to the company is 12%.

You are required to:

a) Calculate the Net Present Value of the project and advise the company if it should proceed. **(10Marks)**

b) Calculate the internal rate of return on the investment the company should expect and interpret your result. (ks)

c) O haracteristics of NPV and IRR as the key methods of evaluation of financial

QUESTION FIVE

 management team, you are asked to explain the following:

(i) The key elements of a t ries.**(4 marks)**

  e of forecasting in busi **mark)**

b) ng to derive a cost-output relationship for his company. The following data has been collected over the past months.

	1	2	3	4	5	6	7	8
	32			40	22	45	27	18

i. Us inear regression analysis, derive the cost output for the 9th year and interpret your answer.

(12 Marks)

ii. Estimate the co-efficient of determination.**(8 marks)**