



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BUSINESS & ECONOMICS
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS
ADMINISTRATION WITH IT
2ND YEAR 1ST SEMESTER 2015/2016 ACADEMIC YEAR
MAIN CAMPUS - RESIT

COURSE CODE: ABA 205

COURSE TITLE: MANAGEMENT MATHEMATICS II

EXAM VENUE: LAB 1

STREAM: (BBA)

DATE: 04/05/16

EXAM SESSION: 9.00 – 11.00 AM

TIME: 2 HOURS

Instructions:

- 1. Answer Question ONE (COMPULSORY) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE

- a. The demand and supply equations for a certain commodity are $3p+5x=200$ and $7p-3x=56$, respectively. Use matrices to find the value of x and p at the market equilibrium. (6mks)
- b. State the characteristics of the Dual problem in Linear Programming. (5mks)
- c. Explain the purposes of Input –Output Analysis. (7mks)
- d. Determine the local and global optimum and their nature for the following function.
 $F(x) = 1/3x^3 - 4x^2 + 12x + 2 \quad 0 \leq x \leq 10$ (12mks)

QUESTION TWO

- a. Marginal cost function for a firm at the production level x is given by
 $C'(X) = 23.5 - 0.01X$
Find the increase in total cost when the production level is increased from 1000 to 1500 units. (16mks)
- b. Explain four applications of Matrices in business. (4mk)

QUESTION THREE

The cost accountant of a firm producing colour television has worked out the Total cost function for the firm to be $C = 120Q - Q^2 + 0.02Q^3$ where C is the total cost and Q the quantity produced. And sales manager has provided the sales forecasting function as $P = 114 - 0.25Q$ where P is the price and Q the quantity sold.

Required:

- a) Find the level of production that will yield minimum average cost per unit and determine whether this level of output maximizes profit for the firm. (15mks)
- b) Determine the maximum revenue for this firm. (5mks)

QUESTION FOUR

- a. The state -transition matrix for retentions, gains, and losses of firms A, B and C is given below. Using this matrix, determine the steady state equilibrium conditions: (16mks)

	TO		
From	A	B	C
A	0.700	0.100	0.200
B	0.100	0.800	0.100
C	0.200	0.100	0.700

b. State two conditions that must be satisfied for linear programming to be used in optimization of problems. **(4mks)**

QUESTION FIVE

a) XYZ Chemical Company is producing two products A and B .The processing times are 3 hour and 4 hours per unit for A on operations one and two respectively and 4 hours and 5 hours per unit for B on operations one and two respectively. The available time is 18 hours and 21 hours for operation one and two respectively. The product A can be sold at sh.3 profit per unit and B at sh.8 per unit .Solve for maximum profit programme.**(only formulate the problem)** **(8mks)**

b) **Distinguish between the following terms:**

- i. Slack and Surplus variables. **(4mks)**
- ii. Point of inflection and Global maxima. **(4mks)**
- iii. Duality and unrestricted variable. **(4mks)**