



GARISSA UNIVERSITY

UNIVERSITY EXAMINATION **2017/2018** ACADEMIC YEAR **ONE**
FIRST SEMESTER EXAMINATION

SCHOOL OF BUSINESS AND ECONOMICS

FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

COURSE CODE: MBA 817

COURSE TITLE: OPERATION RESEARCH

EXAMINATION DURATION: 3 HOURS

DATE: 07/12/17

TIME: 09.00-12.00 PM

INSTRUCTION TO CANDIDATES

- The examination has FIVE (5) questions
- Question ONE (1) is COMPULSORY
- Choose any other THREE (3) questions from the remaining FOUR (4) questions
- Use sketch diagrams to illustrate your answer whenever necessary
- Do not carry mobile phones or any other written materials in examination room
- Do not write on this paper

This paper consists of THREE (3) printed pages

please turn over



QUESTION ONE (COMPULSORY)

- (a) Briefly explain the following terms
 - i. Objective function [2 marks]
 - ii. Constraints [2 marks]
 - iii. Optimum solution [2 marks]
- (b) The manager of a bank observes that on the average 18 customers are served by a cashier in a hour. Assuming that the service time has are experimental distribution, what is the probability that;
 - i. A customer shall be free within 3 minutes [3 marks]
 - ii. A customer shall be serviced in more than 12 minutes [3 marks]
- (c) Briefly explain the number of possibilities when picking up from the waiting line for service [3 marks]

QUESTION TWO

- (a) Briefly explain the steps contained in solving a transportation problem [6 marks]
- (b) Solve the following transportation problem. Obtain the initial solution by NW corner rule.

		TO				Supply
		1	2	3	4	
From	A	7	3	8	6	60
	B	4	2	5	10	100
	C	2	6	5	1	40
Demand		20	50	50	80	200

[9 marks]

QUESTION THREE

- (a) Linear programming problem is based on specific assumptions. Highlight and explain these assumptions [6 marks]
- (b) Solve graphically the following LPP

Maximize $Z = 4x + 5y$

Subject to constraints

$$2x + 3y \leq 12$$

$$2x + y \leq 8$$

And $x, y \geq 0$

[9 marks]



QUESTION FOUR

(a) Two firms are competing for business. Whatever firm A gains, B firm loses. The table given below shows advertising strategies of both the firms and utilities to firm A for various market shares in percentages (assuming this to be a zero sum game):

		Firm A's Utility		
		Firm B		
		Press	Radio	T.V.
Firm A	Press	60	75	40
	Radio	75	75	60
	T.V.	60	70	70

Find optimal strategies for both firms and expected percentage of market shares to firm A.

[8 marks]

(b) Determine the break-even sales in the following case:

		Product		
		A	B	C
Sale (Units)		5000	6000	4000
Unit selling price (Ksh.)		10	15	18
Unit variable cost (Ksh.)		6	4	13
Fixed cost (Ksh)		4000		

[7 marks]

QUESTION FIVE

(a) Outline and explain the general assumptions made to solve the sequencing problems. **[7 marks]**

(b) Discuss the operating characteristics of queuing system **[8 marks]**

