



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING Y5S2

EMG 2518: OPERATIONS RESEARCH

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Attempt Choose instruction.

Do not write on the question paper.

Question ONE

- (a) Explain basic facts of Operations Research as a concept (6 marks)
- (b) Operations Research is a scientific approach in analyzing operational decision problems. Discuss the procedure taken in providing a solution to a problem in operations. (14 marks)

Question TWO

- (a) Explain applications of Operations research in business and production (8 marks)
- (b) Explain limitations of Operations research (6 marks)
- (c) Explain the properties of linear programming model (6 marks)

Question THREE

Kongoea Enterprises produces two products, X and Y. X has a contribution of Ksh.3 per unit and Y, Ksh.4 per unit. The production data are as follows:

	Per unit		
	Machining (Hours)	Labour (Hours)	Material (Kgs)
X	4	4	1
Y	2	6	1
Total available per week	100	180	40

Because of a trade agreement, sales of X are limited to a weekly maximum of 20 units and to honour an agreement with an old established customer at least 10 units of Y must be sold per week.

Required: As a Production Manager of Kongoea Enterprises establish a weekly production plan that maximises contribution. Use graphical method. **(20 Marks)**

Question FOUR

(a) Explain the following terms as applied in inventory model

- i) Lead or Procurement time
- ii) Demand
- iii) Physical stock
- iv) Free stock
- v) Buffer stock
- vi) Maximum stock
- vii) Re-order level
- viii) Re-order Quantity
- ix) Inventory cycle
- x) Economic Order Quantity (EOQ)

(10 marks)

(b) Discuss reasons for holding stocks

(10 marks)

Question FIVE

(a) Differentiate between cooperative and non-cooperative game theories and explain where each is applied

(5 marks)

(b) Discuss with illustrations, the prisoners' dilemma as applied in game theory.

(15marks)