TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

BSC. MECHANICAL ENGINEERING Y5S2

EMG 2518 : OPERATIONS RESEARCH

SUPPLEMENTARY/SPECIAL EXAMINATION

SERIES: APRIL 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 five questions. Attempt any THREE questions.
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)**