MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF COMMERCE

UNIVERSITY ORDINARY EXAMINATION

2018/2019 ACADEMIC YEAR

THIRD YEAR **FIRST** SEMESTER EXAMINATION FOR, BACHELOR OF COMMERCE AND BACHELOR OF PROCUREMENT AND SUPPLY MANAGEMENT
AMS 333 – QUANTITATIVE METHODS

DURATION: 2 HOURS

DATE:

TIME:

Instructions to candidates:

1. Answer question One and Any Other Two questions
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a) Clearly distinguish between;

i. A zero sum and non-zero sum game (2marks)

ii. A pure strategy and a mixed strategy game (2marks)

iii. Explain two limitations of game theory (2marks)

b) A bag contains 6 yellow and 4 green beads. Two beads are picked randomly one at a time without replacement;

i. Draw a probability true diagram to represent the information (4marks)

ii. The probability that the beads picked are of similar colour (2marks)

iii. The probability at least one is yellow (3marks)

c) An economy has 3 industries; oil, tire and iron. The industries are inter-dependant. Each unit of oil requires 0.2 units from oil, 0.3 from Tire and 0.4 units from iron. A unit from Tire requires 0.2 units from oil, 0.4 units from Tire and 0.2 units from iron. The final demand is 40million units from oil, 60million units from tire and 50million units from iron.

Required;

i. The technical co-efficient matrix (3marks)

ii. The Leontief's in were matrix (10marks)

iii. The total output of each industry (2marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a) A gave is played by tossing a fair six sided dice such that you earn triple the point if you get an odd number and double if you get an even unless it is the last face in which you are given a biased coin whose head is twice as likely as the tail and toss it once. If you get a fail you lose 20 points, but if you get a head you earn 12 points. How much would one expect to earn in such a game? (Hint; use probability tree) (10marks)

b) Discuss five environments under which a decision can be made (10marks)

QUESTION THREE (20 MARKS)

a) Spins ltd is trying to set the selling price of its products. Three prices are available for consideration; shs.4, shs.4.30 and shs.4.40. The following is also provided;

Expected sales units at;	shs.4	shs.4.30	shs.4.40
Best possible	16,000	14,000	12,500
Condition most likely	14,000	12,500	12,000
Worst possible	10,000	8,000	6,000

The fixed costs are shs.20,000 while the variable cost per unit is shs.2

Required;

Advice the management on the unit price using;

i. Maximax rule (2marks)
ii. Minimax rule (2 marks)
iii. Hurwitzic (take α=0.8) (2marks)
iv. Laplace/criterion of insufficient reason (4marks)
v. Savage rule/minimax regret criterism (4marks)

b) Suppose the probability of the best possible is 0.3, most likely is 0.4 and worst possible is 0.3. Advice the company using;
   i. Expected monetary value(EMV) (3marks)
   ii. Expected opportunity loss (EOC) (3marks)

QUESTION FOUR (20 MARKS)

a) A manufacturer produces two products I and II. Each unit of product I requires 4 units of material A and 3 units of material B, while each unit of product ii requires 2 units of material A and 6 units of material B. In any one month there are 240 units of material A and 360 units of material B. the two products give a contribution of shs.70 and shs.80 respectively. The manufacturer wishes to establish the monthly products on mix that will maximize contribution.
   Required;
   i. A linear programming model to solve this problem (4marks)
   ii. Use graphical method to determine a production plan that will maximize contribution (8marks)

b) Describe four assumptions of linear programming (8marks)