# Commodity Futures Markets
## Practice Exam

## Instructions

The Exam is worth 20% There are three (3) questions with multiple parts.. Answer the questions in the spaces provided on the question sheets. If you run out of room for an answer, continue on the back of the page. Show working for all answers. Please note graph paper is attached.

## Questions

1. Compare the von Neumann axioms for expected utility to the Savage axioms. You should list each axiom discuss it's meaning and it's relationship to the corresponding axiom in the other system. Where possible give examples. (10 points)

   Answer:

2. Given the following data formulate a linear programming model to find an optimal farm plan based on minimization of total absolute deviations (MOTAD). You DO NOT NEED TO SOLVE THE OPTIMIZATION PROBLEM. Your answer should be presented either as a tableau, in matrix form or in scalar form (with appropriate summations) (6 points)

- Activities: carrots $x_1$, celery $x_2$, cucumbers $x_3$ and peppers $x_4$
- Resources: acreage of land $b_1$, hours of labor $b_2$, rotational and marketing constraint $b_3$

$$A = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 25 & 36 & 27 & 87 \\ -1 & 1 & -1 & 1 \end{bmatrix}$$

$$b = \begin{bmatrix} 200 \\ 10,000 \\ 0 \end{bmatrix}$$

Other data time series of gross margins needed.

| | dollars | | | |
|---|---|---|---|---|
| 1 | 292 | -128 | 420 | 579 |
| 2 | 179 | 560 | 187 | 639 |
| 3 | 114 | 648 | 366 | 379 |
| 4 | 247 | 544 | 249 | 924 |
| 5 | 426 | 182 | 322 | 5 |
| 6 | 259 | 850 | 159 | 569 |
| Average | 253 | 443 | 284 | 516 |

Answer:

3. Given the following data calculate
   Goods are sold at a rate of 1 per day, the costs of ordering new goods are $10 irrespective of the size of the order and each item ordered costs $1 the costs of storing goods are 0.5 per item stored. the lead-time for orders is 1 day and initially 10 items are in stock.

   (a) When supplies should be ordered (2 points)

   (b) How much should be ordered (2 points)

Answer: