EMIS 7300 (NTU SYS 521): Systems Analysis Methods
Professor: Eli Olinick

Instructions for the site coordinator:

1. The student has 80 minutes to complete this exam.
2. The exam may be taken on any date between (and including) September 23, 2004 and September 30, 2004.
3. The completed exam must be returned via fax (214 768 1112) to Professor Olinick at SMU by 5:00 P.M. (Dallas Time) September 30, 2004. Before faxing the exam please check both sides of each page of the original to see if the student has done in any work on the back side of any of the exam pages. If this is the case, please send both sides of the page.
4. Students are free to refer to their textbook (Quantitative Analysis for Management, by Render, Stair, and Hanna, Eighth Edition) and notes, and may use hand-held, electronic calculators during this exam. Students may **not** use laptop computers for this exam.
5. Please keep the student's original exam until December 15, 2004 in case there are problems with the fax transmission.
6. Please complete and sign the following form before returning the exam to Professor Olinick:

Student's Name: _____
Exam Date: _____
Time Started: _____
Time Finished: _____

I certify that the above information is correct. I have proctored this exam taken by the above named student and verified that the academic integrity of this examination was not compromised.

Signature: _____

Date: _____

- You have 80 minutes to complete this exam.
- You may refer to your book and notes.
- You may use a hand-held calculator, or the calculator application on a PDA or palm computer, to do basic arithmetic. Any other type of electronic computation is **not** allowed.
- Present your work in an organized and neat fashion.
- Clearly state and explain your assumptions (if any), statements, and arguments. Your grade will be significantly affected by the clarity of your answers.
- To receive full credit, you must **explain your answers** and show all your work.

Problem	1	2	Total
Possible Score	10	10	20
Your score			

LAST NAME: _____

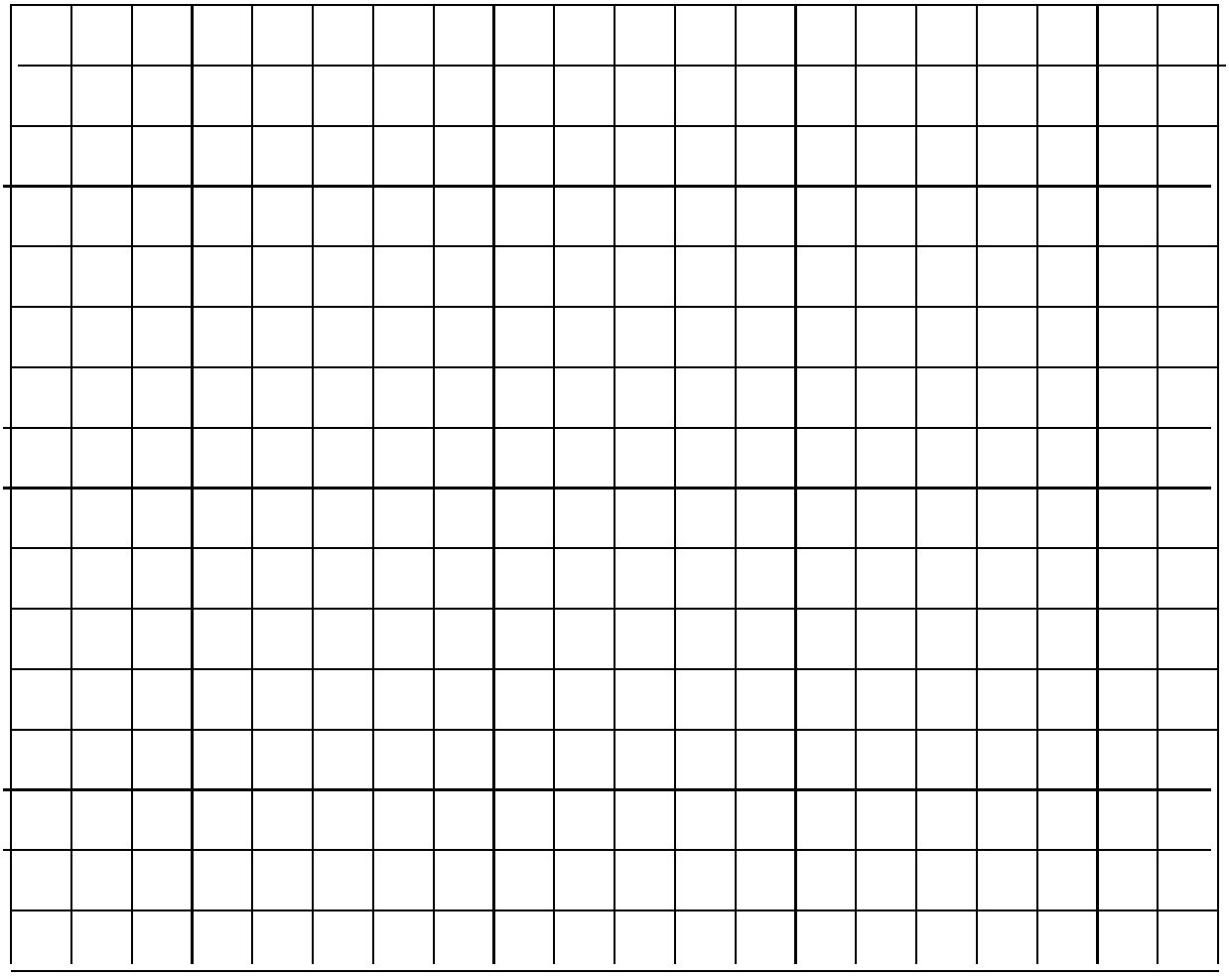
FIRST NAME: _____

Problem 1

(10 pts.)

Please graphically solve the following linear program. Be sure to identify *all feasible corner-point solutions*, the *optimal solution* and the *optimal objective function value*.

$$
\begin{array}{rrrrr}
max & 3x_1 & +2x_2 & & \\
s.t. & 2x_1 & +x_2 & \leq & 100 \\
 & x_1 & +x_2 & \leq & 80 \\
 & x_1 & & \leq & 40 \\
 & & x_1 & & \geq 0 \\
 & & & x_2 & \geq 0
\end{array}
$$



Problem 2

(10 pts.)

Please formulate the problem below as a linear program. Be sure to define your decision variables and explain your constraints.

Problem: A company that manufactures a single product must meet the following demand on-time in each of three quarters: Quarter 1: 30 units; Quarter 2: 20 units; Quarter 3: 40 units. Each quarter, up to 27 units can be produced with regular-time labor, at a cost of \$40 per unit. During each quarter, an unlimited number of units can be produced with overtime labor, at a cost of \$60 per unit. Of all units produced, 20% are unsuitable and cannot be used to meet demand. A cost of \$15 per unit is assessed against the quarter's ending inventory. The manufacturer wishes to minimize the costs of meeting the next three quarters' demands. Assume that 20 usable units are available at the beginning of Quarter 1.

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You may use it to write your answers for Problem 2.