All Syracuse University policies and procedures concerning academic honesty apply to this course:

"Syracuse University students shall exhibit honesty in all academic endeavors. Cheating in any form is not tolerated, nor is assisting another person to cheat. The submission of any work by a student is taken as a guarantee that the thoughts and expressions in it are the student's own except when properly credited to another. Violations of this principle include: giving or receiving aid in an exam or where otherwise prohibited, fraud, plagiarism, the falsification or forgery of any record, or any other deceptive act in connection with academic work. **Plagiarism is the representation of another's words, ideas, programs, formulae, opinions, or other products of work as one's own either overtly or by failing to attribute them to their true source.**" (Section 1.0, University Rules and Regulations)

**WARNING!!!**

While homework problems may have been done cooperatively, **exams are individual work.** Do not communicate about this exam with anyone except the instructor [x3-2345 or e-mail to jskelly@maxwell.syr.edu]. **Violation of this rule will result in a grade of 0 for the exam.** Any notices will be sent to you by e-mail; check occasionally.

**EXPLAIN** your answers carefully.

**DUE: 9:30 am, Thursday, April 3, in class.**
EXPLAIN your answers carefully. DUE: 9:30 am, Thursday, April 3, in class.
The four problems are each worth 25 points.

1. (Signaling) There are two types, H and L, high and low productivity. \( \theta_L = 1 \) and \( \theta_H > 1 \). For education level \( e \), and productivity level \( \theta \),

\[
U_i = w + \theta e - C(e, \theta_i)
= w + \theta e - \frac{e^2}{\theta_i}
\]

that is, education enters positively into the utility function but in a way that varies with \( \theta \). Determine - as functions of \( \theta_H \) - the minimum \( e_m \) and maximum \( e_M \) values of \( e \) that H-types choose as part of a separating signaling equilibrium.

2. (Signaling) There are two types, H and L, high and low productivity. \( \theta_L = 1 \) and \( \theta_H = 2 \). For education level \( e \),

\[
U_i = w + e - C(e, \theta)
= w + e - \frac{e^2}{\theta_i}
\]

A fraction \( \lambda \) of the workers are H-type. Consider an equilibrium where 1/3 of the H-types and 2/3 of the L-types are separated and the rest of the workers are pooled. Determine - as a function of \( \lambda \) - the education levels \( e_L \), \( e_p \), and \( e_H \) chosen.

3. (Screening) There are two types, H and L, high and low productivity, with parameters \( \theta_L = 1 \) and \( \theta_H = 3 \). For task level \( t \),

\[
U_i = w - C(t, \theta_i)
= w - \frac{t^2}{\theta_i}
\]
Productivity depends on task level: \( P_i = \theta_i + \mu t \). Determine any separating equilibria.

4. (Screening) There are two types, H and L, high and low productivity, with parameters \( \theta_L = 1 \) and \( \theta_H = 3 \). For task level \( t \),

\[
U_i = w - C(t, \theta_i) \\
= w - \frac{t^2}{\theta_i}
\]

Productivity depends on task level: \( P_i = \theta_i + \lfloor t \rfloor \). Determine any separating equilibria.