INSTRUCTIONS:

1. Answer ONLY the specified number of questions from the options provided in each section. Do not answer more than the required number of questions. Each section takes one hour.

2. Your answers must be on the paper provided. No more than one answer per page. Do not answer two questions on the same sheet of paper.

3. If you use more than one sheet of paper for a question, write "Page 1 of 2" and "Page 2 of 2."

4. Write ONLY on one side of each sheet. Use only pen. Answers in pencil will be disqualified.

5. Write **------ END -----** at the end of each answer.

6. Write your exam identification number in the upper right-hand corner of each sheet of paper.

7. Write the question number in the upper right-hand corner of each sheet of paper.

Section 1: Microeconomic Theory—Answer Any Two Questions.

1A. (Econ 201) n bystanders witness a crime. Each bystander has two actions: call or do not call the police. If someone calls the police, each bystander gets a value of v; the bystanders who call the police each incur a cost of c (assume that $v > c > 0$). If no one calls the police, all bystanders get 0. The payoff of each bystander is the value (if any) minus the cost (if any). Find the symmetric mixed-strategy Nash equilibrium as a function of n. And calculate the probability that no one calls the police in the equilibrium when $n \to \infty$.

1B. (Econ 201) Grace's preferences are described by the utility function $U(x_1, x_2) = \alpha x_1 + \beta ln x_2$. Her income is I and prices of both good are p_1 and p_2, respectively. α and β are positive constants.

    a. Find her uncompensated demand functions for $x^*{}_1$ and x^*_2 using the Lagrangian method.
    b. Calculate the compensated demand functions for x_1 and x_2.

1C. (Econ 104) The demands for a monopolist's two products are determined by the equations

$$p = 25 - x, \qquad q = 24 - 2y$$

where p and q are prices per unit of the two goods, and x and y are the corresponding quantities. The costs of producing and selling x units of the first good and y units of the other are
$$C(x, y) = 3x^2 + 3xy + y^2$$

    a. Find the monopolist's profit $\pi(x, y)$ from producing and selling x units of the first good and y units of the other.
    b. Find the values of x and y that maximize $\pi(x, y)$. Verify that you have found the maximum profit.

(over)