ECN 594: Final Exam

March 4, 2026

Instructions:

- You have **70 minutes**
- You may bring a calculator and notes on a two-sided cheat-sheet (letter-size paper)
- Please be neat. If your work is too messy it will not be graded.
- Be sure to show your working.
- This exam is **cumulative**—it covers all course material
- Good luck!

Name: _____

Question:	1	2	3	4	Total
Points:	30	25	25	20	100
Score:					

1. Short Answer Questions (30 points)

1. For each question, write either a number/formula, True/False/NEI, or a brief answer.

   (a) (3 points) In a Cournot market with 4 identical firms, demand $P = 80 - Q$, and $MC = 20$, what is the equilibrium price?

   (a) _____

   (b) (3 points) Write the Lerner Index formula relating markup to market share and elasticity.

   (b) _____

   (c) (3 points) True, False, or NEI: The Bertrand model predicts that adding a third firm to a duopoly will significantly reduce prices.

   (c) _____

   (d) (3 points) What is the "recapture effect" in merger analysis?

   (d) _____

   (e) (3 points) True, False, or NEI: In the logit model, adding demographic interactions allows different consumer types to have different substitution patterns.

   (e) _____

   (f) (3 points) What is a "most-favored-customer clause" and how does it facilitate collusion?

   (f) _____

   (g) (3 points) True, False, or NEI: In entry deterrence, the incumbent's threat to flood the market is always credible.

   (g) _____

   (h) (3 points) What is the "free-rider problem" in the context of vertical restraints?

   (h) _____

   (i) (3 points) True, False, or NEI: Under a two-part tariff with heterogeneous consumers, the optimal per-unit price is always equal to marginal cost.

   (i) _____

   (j) (3 points) Name one factor that makes collusion harder to sustain.

   (j) _____

2. Entry and Market Structure (25 points)

2. Consider a market with inverse demand $P = 150 - 2Q$. Firms compete in quantities (Cournot) and each has total cost $C(q) = 50q + 100$ (so $MC = 50$ and fixed cost $F = 100$).

   (a) (6 points) How many firms will enter in free entry equilibrium? (Hint: Find N^* such that $\pi(N^*) \geq 0$ but $\pi(N^* + 1) < 0$.)

   (b) (6 points) Compare the free entry outcome to the socially optimal number of firms. Is there too much or too little entry? Explain.

   (c) (6 points) Now suppose there is an incumbent with a cost advantage: $MC_1 = 30$. All potential entrants have $MC = 50$. If one entrant enters, find the equilibrium quantities and profits.

   (d) (7 points) In the asymmetric case from (c), can the incumbent deter entry by committing to a high output level? What quantity would deter entry, and is it profitable to do so?

3. Merger Simulation (25 points)

3. Consider a market with 3 differentiated products, each owned by a different firm. The logit demand system has $\alpha = -0.5$. Pre-merger data:

Product	Price	Market Share	Marginal Cost
1	\$20	15%	\$12
2	\$22	12%	\$14
3	\$18	10%	\$10
Outside	–	63%	–

(a) (5 points) Verify that product 1's markup is approximately consistent with the logit FOC: $p - c = \frac{1}{|\alpha|(1-s)}$.

(b) (5 points) Compute the own-price elasticity for each product. Are all products in the elastic portion of demand?

(c) (8 points) Firms 1 and 2 propose to merge. Explain intuitively why the merged firm will raise prices. Using the ownership matrix approach, write down the new first-order conditions for products 1 and 2.

(d) (7 points) Compute the pre-merger HHI. If the merger raises HHI by 360 points, what is the post-merger HHI? Would this merger likely be challenged?

4. Collusion and Detection (20 points)

4. A market has 2 firms competing in quantities (Cournot). Demand is $P = 100 - Q$ and both firms have $MC = 10$.

   (a) (5 points) Find the Cournot-Nash equilibrium and collusive (monopoly) outcomes.

   (b) (5 points) Compute the critical discount factor for sustaining collusion with grim trigger strategies.

   (c) (5 points) The firms operate under antitrust scrutiny. If caught colluding, they face a fine of F per period. How does this affect the sustainability of collusion? What fine F would make collusion unsustainable for $\delta = 0.8$?

   (d) (5 points) Describe two empirical "smoking guns" that might indicate the presence of collusion in this market.