NOVA SCHOOL OF BUSINESS & ECONOMICS

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May 24, 2025 Time: 2:00

INDUSTRIAL ORGANIZATION (B.S. in Economics and B.S. in Management)

Final exam (regular season)

Answer each question on a separate sheet of paper. Good luck!

1. [15 minutes; 4 points] The following statement was recently made by a former student of this course:

"When the interest rate is very close to one, firms will collude."

Comment in no more than ten lines (graphs, if any, excluded) while agreeing or disagreeing.

2. [15 minutes; 4 points] Jane Theory, the best student in her class, said:

"The empirical observation that many markets appear to be intensely competitive shows that the tacit collusion theory is false."

Comment in no more than ten lines (graphs, if any, excluded) while agreeing or disagreeing.

3. [45 minutes; 6 points] A town has 100 consumers willing to buy an homogeneous product. Each consumer is either rich or poor. Rich consumers, who number 80, have a willingness to pay for the good equal to 6, whereas poor consumers, who number 20, have a willingness to pay for the good of 4. Rich consumers do not search for the best price. They pick a store randomly (with equal probability) and purchase the product at the price posted by the store. Poor consumers search all the stores and buy from the one that posts the lowest price. Firms cannot distinguish between rich and poor consumers. If more than one store posts the lowest price, they randomly (with equal probability) buy from one of them. Two stores, *L* and *F*, serve this town, both producing the product at a constant marginal and average cost of 2. They compete in prices, which they set *sequentially*, with *L* setting its price first, and *F* posting its price second.

- (i) Draw the town's demand curve for the product.
- (ii) Which price will firm *F* choose if *L* prices above 4? Quantify and explain.
- (iii) Which price will firm *F* choose if *L* prices equal or below 4? Quantify and explain.
- (iv) Which price will firm *F* choose? Quantify and explain.
- (v) Which price will firm *L* choose? Quantify and explain.
- (vi) How much will each firm earn? Quantify and explain.
- (vii) Is there a first-mover advantage benefiting firm *L*? Is there a last-mover advantage benefiting firm *F*? Explain succinctly.
- (viii) How would the answers to (ii), (iii), (iv), (v), and (vi) change if the two firms were to quote their price simultaneously and independently? Explain.

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4. [45 minutes; 6 points] Three firms serve a domestic market for an homogeneous good whose *yearly* demand is q = 10 - p. One of them is an importer who *every year* imports and sells 2 physical units in the domestic market as long as the equilibrium price equals or exceeds 2, the constant marginal and average cost at which it imports the good. The two domestic firms both produce the good at a constant marginal and average cost of 2. Firms compete in quantities, which they set simultaneous and independently at the beginning of each year. All firms expect to serve this market forever. [Denote the discount factor by δ .]

- (i) What is the residual demand faced by the domestic firms? Quantify and explain.
- (ii) What is the optimal collusion quantity? Quantify and explain.

Assume that, if the domestic firms do tacitly collude, they do so around the optimal collusion quantity.

- (iii) Can the two domestic firms tacitly collude? If so, under what condition? Quantify and explain intuitively.
- (iv) How much will each domestic firm earn? And the importer? Quantify and explain intuitively.
- (v) Suppose that the two domestic firms (illegally) propose to the importer that they cartelize the domestic market while all selling the same quantity, thus forming an equitable cartel. Will the importer accept? Quantify and explain.
- (vi) Can we say that the importer free rides and thus exerts a negative externality on the two domestic firms? Quantify and explain.