

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

Midterm exam

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:

“Firms always alter the price they charge as demand fluctuates.”

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:

“Brands allow firms to create differentiated varieties. Doing so decreases price competition, thus reducing consumers’ welfare. Therefore, branding should not be allowed.”

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

3. [45 minutes; 6 points] Two firms, *A* and *B*, supply a market for an homogeneous good whose demand is $q = 10 - p$. Both firms produce the good at a constant marginal and average cost of 4. These firms compete in quantities, which they choose simultaneously and independently.

(i) What quantity will each firm choose? What will each firm’s profit be? Quantify and explain.

Both firms produce the good by using an old, well-known technology. Another firm, *S*, offers to supply a new, more efficient technology that would lower the constant marginal and average cost of production to 2. However, this new technology entails a capacity constraint: it only allows for two units of output to be produced by each firm. Both firms were given access to the new technology.

(ii) How much is the new technology worth to each firm? Quantify and explain.

(iii) How much would it be worth in the absence of the capacity constraint? Quantify and explain.

(iv) Decompose the value of the new technology into two parts: “increased-efficiency” effect and “reduced-competition” effect. Quantify and explain.

4. [45 minutes; 6 points] Two firms, *A* and *B*, supply a market for an homogeneous good whose demand is $q = 10 - p$. Both firms produce the good at a constant marginal and average cost of 3. These firms compete in prices, which they choose simultaneously and independently.

(i) What price will each firm choose? What will each firm’s profit be? Quantify and explain.

Both firms produce the good by using an old, well-known technology. Another firm, *S*, offers to supply a new, more efficient technology that would lower the constant marginal and average cost of production to 2.

(ii) How much is the technology worth to either firm if both were to buy it? Quantify and explain.

(iii) Will both buy it from S , who charges a price $s > 0$? Just one of the two firms? None will? Quantify and explain.

(iv) What impact will the new technology have on the price at which the good is sold? And on the profit of both A and B ? And on social welfare? Quantify and explain.

Suppose now that firm S decides to rent rather than sell the new technology by charging c' per unit of output that the firm renting it sells to consumers. Hence, the marginal cost of a firm who rents the technology will be $2 + c'$, instead of 3.

(v) How much is the technology worth to either firm if both were to rent it? Quantify and explain.

(vi) May both rent it? May just one of the two firms rent it? May none do it? Quantify and explain.

(vii) What value should S choose for c' ? Quantify and explain.