LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

Microeconomics II

Licenciatura in Economics

10th of April 2018
Duration: 45m + 45m

Midterm Test — Part A

Maximum duration of Part A: 45 minutes

Full Name: …… A

Student Number: ………………………

Class: ………………………

1. Mark your answers with an 'O' in the table below. You get 0.625 marks for each right answer, and a 0.625/3 (≈ 0.208) deduction for any wrong answer.

2. You cannot look up books or notes of any kind. Invigilators will not help you with the test.

3. You cannot use calculators, computers, mobile phones, or any other data storage device.

4. This test paper must be returned to the invigilator even if you decide not to take the test.

ANSWER SHEET

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c
d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d

1. A monopolist's marginal revenue and marginal cost curves cross at $y = 15$. For this output level, marginal cost and marginal revenue are both €19, average cost is €15, and the price charged is €38. The monopolist's profit is:

   a) €225.
   b) €570.
   c) €285.
   d) €345.

2. A monopolist causes a deadweight loss because:

   a) It produces more than the efficient output level.
   b) It produces less than the efficient output level.
   c) It charges a price below marginal cost.
   d) It earns excessive profit.

3. If a market goes from perfect competition to monopoly:

   a) Economic profit is transferred to the government.
   b) Some consumer surplus is transferred to the producer.
   c) Some producer surplus is transferred to consumers.
   d) None of the other alternatives is correct.

4. A natural monopoly that is forced to charge a price equal to marginal cost will bear a loss because:

   a) A price equal to marginal cost maximises consumer surplus.
   b) Marginal cost is constant and equal to the price.
   c) The demand curve is negatively sloped, so price falls as quantity increases.
   d) Its marginal cost is lower than its average cost.

5. The quantity produced by a perfectly price-discriminating monopolist is such that:

   a) The price of the last unit sold equals the marginal cost.
   b) Producer surplus is maximised.
   c) All other answers are correct.
   d) Total surplus is maximised.

6. Facing two different demand curves, a third-degree-price-discriminating monopolist will:

   a) Sell more than a perfectly price-discriminating monopolist would.
   b) Capture all the consumer surplus.
   c) Charges a higher price in the less elastic market.
   d) Charges a higher price in the more elastic market.

7. A quantity discount is an example of:

   a) Perfect price discrimination.
   b) Second-degree price discrimination.
   c) Third-degree price discrimination.
   d) No price discrimination.

8. The profit-maximising two-part tariff allows the monopolist to:

   a) Capture all the consumers' surplus.
   b) Sell a higher quantity than a perfectly competitive industry would.
   c) Sell a higher quantity than a perfectly price discriminating monopolist would.
   d) All other answers are correct.

9. In the Cournot model:

   a) Firms choose quantities.
   b) All other answers are correct.
   c) Firms make decisions simultaneously.
   d) Firms do not cooperate.

10. Relative to a cartel, firms in a Cournot market will:

    a) Make a higher joint profit.
    b) Sell less.
    c) Make a lower joint profit.
    d) All other answers are correct.

11. In a Cournot model a firm will choose to produce more if:

    a) If the number of firms in the market increases.
    b) It the leader chooses to sell less.
    c) None of the other alternatives is correct.
    d) The sum of its rivals' outputs increases.

12. In a Cournot duopoly, firms have zero marginal costs and face the demand curve $p = a - bY$ ($Y = y_1 + y_2$). Firm 1's reaction function is:

    a) $y_1 = 0.5(a - by_2)/b$.
    b) $y_1 = 0.5(a - 2by_2)/b$.
    c) $y_1 = a/b$.
    d) $y_1 = 0.5a/b$.

13. Which of the following best explains why the Stackelberg leader cannot make less profit than it would in a Cournot equilibrium?

    a) The leader is the firm with the most market power.
    b) By definition, the leader is the firm with the most profit.
    c) The leader could choose to produce the same as in the Cournot equilibrium.
    d) The leader is able to foresee the follower's decision.

14. Relative to Cournot, in a Stackelberg duopoly:

    a) The firm deciding last benefits because it already knows the other firm's output level.
    b) The firm deciding first benefits because it reveals its output level before the other firm chooses its own.
    c) Both firms benefit from the sequential decision making.
    d) None of the other alternatives is correct.

15. Two firms join in a cartel and maximise joint profit by producing $y_1 = 6$ and $y_2 = 3$. Then the relation between marginal costs is:

    a) $MC_1(6) = MC_2(3)$.
    b) $MC_1(6) = 2MC_2(3)$.
    c) $MC_1(6) = 0.5MC_2(3)$.
    d) $MC_1(x) < MC_2(x)$ for any $x > 0$.

16. In a Bertrand duopoly where two firms actually produce, the equilibrium price is:

    a) Equal to the marginal cost.
    b) Equal to the average cost.
    c) Higher than the marginal cost.
    d) Higher than the average cost, but lower than the marginal cost.

Midterm Test — Part B

Maximum duration of the exam: 1 hour and 30 minutes

Full Name: ………

Student Number: ………………………   Class: ………………………

1. You cannot look up books or notes of any kind. Invigilators will not help you with the test.

2. Switch off and put away any graphical calculators, computers, mobile phones, or any other data storage device.

QUESTION 1 (5 marks)

In a market with inverse demand curve $p(y) = 40 - 0.1y$ there is a single firm, which has the cost function $c(y) = 10y$.

a) (2 marks) Find the profit-maximising quantity and price, and the profit. Show your calculations.

b) (2 marks) Find the deadweight loss caused by the monopoly.

c) (1 mark) Now the firm must bear a new fixed cost of 1000. What changes will there be in the profit-maximising quantity and price and the profit level? Explain.

QUESTION 2 (5 marks)

In a market with inverse demand curve $p(Y) = 36 - Y$ there are two firms only, which operate with cost functions $c_1(y_1) = y_1^2 + 7y_1$ and $c_2(y_2) = 2y_2^2$ ($y_1 + y_2 = Y$). The firms compete according to the Cournot model.

a) (2 marks) Do these firms produce differentiated products? Explain.

b) (2 marks) Find the firms' reaction functions. Explain what these functions mean.

c) (1 mark) Find the Cournot equilibrium.

Answers to Part A

Version A (this version)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
d	b	b	d	c	c	b	a	b	c	c	a	c	b	a	a

Answers to Part B

Question 1

a) The monopoly maximises profit where $MC = MR$. Revenue is $p(y)y = 40y - 0.1y^2$; $MR = 40 - 0.2y$. So $MC = MR \Leftrightarrow 10 = 40 - 0.2y \Leftrightarrow y = 150$. $p(150) = 25$. Profit is $py - c(y) = 25 \times 150 - 10 \times 150 = 2\,250$.

b) (A graphical illustration would help here.) Marginal cost equals price for $MC = p \Leftrightarrow 10 = 40 - 0.1y \Leftrightarrow y = 300$. The monopoly sells 150 only, so an additional 150 could be sold at a price higher than marginal cost. The deadweight loss is the surplus these additional units would give rise to if they were sold: $(25 - 10) \times (300 - 150)/2 = 1\,125$.

c) The fee is independent of the quantity sold, so it does not affect the $MC = MR$ condition; and the firm will still make a profit after paying it, so the profit-maximising quantity and price remain the same; only the profit falls by the amount of the fee: $2\,250 - 1000 = 1\,1250$.

Question 2

a) There is a single price which depends on the sum of the firms' outputs, so the product is undifferentiated; otherwise there would be a price for each firm, each dependent on the respective firm's output only.

b) A firm's reaction function gives the firm's profit-maximising quantity as a function of the other firm's output:

$\pi_1 = p(y_1 + y_2)y_1 - c_1(y_1) = (36 - y_1 - y_2)y_1 - (y_1^2 + 7) = 36y_1 - y_1^2 - y_1y_2 - y_1^2 - 7$.

$\partial \pi_1 / \partial y_1 = 36 - 2y_1 - y_2 - 2y_1 = 0 \Leftrightarrow y_1 = 9 - 0.25y_2 = f_1(y_2)$, firm 1's reaction function.

$\pi_2 = p(y_1 + y_2)y_2 - c_2(y_2) = (36 - y_1 - y_2)y_2 - 2y_2^2 = 36y_1 - y_1y_2 - y_2^2 - 4y_2^2$.

$\partial \pi_2 / \partial y_2 = 36 - y_1 - 2y_2 - 4y_2 = 0 \Leftrightarrow y_1 = 6 - y_2/6 = f_2(y_1)$, firm 2's reaction function.

c) There will be an equilibrium if simultaneously $y_1 = f_1(y_2)$ and $y_2 = f_2(y_1)$. Solving the system of equations yields $y_1 = 7.826$ and $y_2 = 4.696$. $Y = y_1 + y_2 = 12.522$. $p(12.522) = 23.478$.