

# **MICROECONOMICS II**

## **INFORMATION ABOUT MIDTERM AND FINAL EXAMS**

### **AND SAMPLE TEST QUESTIONS**

#### **1. Midterm exam**

- 30 points in total
- 80 minutes time
- The midterm exam includes questions on content covered during the lectures and seminars taking place from the beginning of the semester until the week before the midterm exam.
- Structure
  - Multiple-choice questions (with exactly one correct answer) – 11 points in total, 11 questions, 1 point each.
  - Gap-filling questions where you are asked to add one missing word in a sentence – 5 points in total, 5 questions, 1 point each.
  - Computation exercises – 14 points in total; typically, 1 larger exercise for 10 points, 1 smaller exercise for 4 points.
- Only positive points are awarded. No negative points are awarded in case of incorrect answer.
- Right after the midterm exam, there will be a seminar, where you will discuss the solution of the midterm exam.
- There will be one midterm exam only. If you cannot attend the midterm exam, you will be requested to provide confirmation that your health condition prevented you from attending it. In such a case, a higher weight (90%) will be given to your final exam.

#### **2. Final exam**

- 60 points in total
- 100 minutes time
- The final exam includes questions on content covered during the whole semester (including the first part before the midterm exam).
- Structure
  - Multiple choice questions (with exactly one correct answer) – 20 points in total, 10 questions, 2 points each.

- Gap-filling questions where you are asked to add one missing word in a sentence – 8 points in total, 4 questions, 2 points each.
- Computation exercises – 32 points in total; typically, 2 larger exercises for 12 points each, 1 smaller exercise for 8 points.
- Only positive points are awarded. No negative points are awarded in case of incorrect answer.
- There will be four dates for the final exam, one in December, two in January and one in February. The maximum number of attempts for the final exam is three.

### 3. Academic integrity declaration

We regard integrity and honesty as central to the ethos of the Charles University. In the midterm and final exam, you are expected to submit only original and solely your own work, consulting allowed materials only (the set of allowed materials will be specified before the exam). You are not allowed to seek or receive any assistance from any other person. You will be asked to confirm your agreement with this before you start answering the test. Only if you agree to comply with these rules, your test will be evaluated. If you do not agree, your test will be graded by F.

### 4. Sample questions

#### 4.1. Multiple choice questions

4.1.1. A production function  $y = f(x_1, x_2) = \min\{ax_1, bx_2\}$  is an example of:

- (a) Perfect substitution
- (b) Leontief technology
- (c) Cobb-Douglas production function
- (d) Decreasing returns to scale
- (e) None of the above

4.1.2. If a firm moves from one point on an isoquant of production to another point on the same isoquant, which of the following will certainly **not** happen?

- (a) A change in the level of output
- (b) A change in the ratio in which the inputs are combined
- (c) A change in the marginal products of the inputs
- (d) A change in the rate of technical substitution
- (e) A change in profitability

4.1.3. A profit-maximizing monopoly faces an inverse demand function  $p(y) = 30 - y$  while its total costs are  $c(y) = 6y$ , where prices and costs are measured in euros. In the past it was not taxed, but now it must pay a tax of 2 euros per unit of output. After the tax, the monopoly will:

- (a) Increase its price by 1 euro
- (b) Increase its price by 2 euros
- (c) Increase its price by 3 euros
- (d) Decrease the price by 2 euros
- (e) Keep its price constant

## 4.2. Gap-filling questions

4.2.1. Costs that have already been incurred and cannot be recovered are called ..... costs.  
(sunk)

4.2.2. The slope of expansion path is ..... if both inputs are normal. (positive)

## 4.3. Computation exercises

4.3.1. Consider a firm with a long run production function in a form  $y = f(x_1, x_2) = x_1^{1/2} x_2^{1/4}$ . The firm buys inputs at prices  $w_1$  and  $w_2$  and sells its product at price  $p$ .

4.3.1.1. Calculate factor demands functions  $x_1(w_1, w_2, p)$  and  $x_2(w_1, w_2, p)$ . (4 points)

$$(x_1^* = \frac{p^4}{32w_1^3w_2}; x_2^* = \frac{p^4}{64w_1^2w_2^2})$$

4.3.1.2. What is the value of  $x_1^*$  and  $x_2^*$  if  $p = 80$  and prices  $w_1 = 4$  and  $w_2 = 2$ . (2 points)

$$(x_1^* = 10,000; x_2^* = 10,000)$$

4.3.1.3. Now consider the production function in a short-run, when input  $x_2$  is fixed, i.e.,  $\bar{x}_2 = 16$ . Calculate the optimal level of input  $x_1'$  for the market prices  $w_1 = 4$ ,  $w_2 = 2$  and  $p = 80$ . (2 points)

$$(x_1' = 400)$$

4.3.1.4. Calculate the profit in the short run with values from part (3). (2 points)

$$(\pi = 1,568)$$

4.3.2. Consider a perfectly competitive firm with the following short run cost function  $STC(y) = y^3 - 12y^2 + 42y + 256$ .

4.3.2.1. Calculate  $MC$ ,  $AC$ ,  $VC$ ,  $AVC$  and  $FC$  for  $y=8$ . (3 points)

$$(MC = 42; AC = 42; VC = 80; AVC = 10; FC = 256)$$

4.3.2.2. Calculate the output, the price and the profit of the firm assuming it operates at its shutdown point. (3 points)

$$(y = 6; p = 6; \pi = -256)$$

4.3.2.3. Suppose that the cost function in the long-term is  $LTC(y) = y^3 - 12y^2 + 42y$ . What is the equilibrium output of the industry  $Q^*$  and the corresponding number of firms  $n^*$  if the long-run market demand is given as  $D_Q(p) = \frac{138000 - 3000p}{2}$ . (2 points)

$$(Q^* = 60,000; n^* = 10,000)$$