

ORIGINAL
Exam: Economics I

Course No: 5024

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Winter 2001/2002

Date: February, 21, 2002

Name, First name

Student number

Degree/semester

INSTRUCTIONS

- You have 120 minutes to answer **all** questions. Section A is Multiple Choice. Only one question is correct. Section B contains open questions. To answer the questions of Section A please mark the box in front of the correct answer. For answers to the questions of Section B please use the booklet. Keep your answers brief.
- Non-programmable calculators are allowed.
- Please put your name on **all** sheets of Section A.
- Please hand in **all** exam materials.

The weight of the questions is as follows:

A1 – A16	B1a	B1b	B2a	B2b	B3a	B3b	B3c	B4a	B4b	B4c	TOTAL
4 each	3	6	5	4	2	3	4	3	4	2	100

GOOD LUCK!

Section A: Multiple Choice

- A1 A competitive firm produces output using three fixed factors and one variable factor. The firm's short run production function is $q = 163x - 2x^2$, where x is the amount of variable factor used. The price of output is €3 per unit and the price of the variable factor is €9 per unit. In the short run, how many units of x should the firm use?
- A 20
 - B 80
 - C 19
 - D 40
 - E None of the above.
- A2 Suppose a firm's production function is given by $f(x_1, x_2) = x_1 + 3x_2$ and the factor prices are w_1 and w_2 respectively. Then the minimal cost of producing y units of output is given by the cost function $c(w_1, w_2, y)$ that is equal to
- A $\min\{w_1, w_2/3\}y$
 - B $\min\{w_1, 3w_2\}y$
 - C $\min\{w_1/3, w_2\}y$
 - D $\min\{w_1, w_2\}y$
 - E None of the above
- A3 The inverse demand function for mangos is defined by the equation, $p = 91 - 5q$, where q is the number of crates that are sold. The inverse supply function is defined by $p = 3 + 6q$. In the past there was no tax on mangos but now a tax of €44 per crate has been imposed. What are the quantities produced before and after the tax was imposed?
- A 5 crates before and 5 crates after
 - B 16 crates before and 9 crates after
 - C 14 crates before and 7 crates after
 - D 8 crates before and 4 crates after
 - E None of the above.

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- A4 If the demand for The Weekly World News at a local grocery store is described by $Q = 2500 - 400p - I/10$ for $I = €20,000$ and $P = €0.75$, the marginal revenue of an additional paper sold at this store is
- A €0.75
 - B €0.19
 - C €0.25
 - D €0.08
 - E €0.50
- A5 If the short run marginal cost of producing a good is €20 for the first 300 units and €30 for each additional unit beyond 300, then in the short run, if the market price of output is 27, a profit maximizing firm will:
- A produce a level of output where marginal revenue equals marginal cost.
 - B produce as much output as possible since there are constant returns to scale.
 - C produce up to the point where average cost equals 27.
 - D not produce at all, since marginal cost is increasing.
 - E produce exactly 300 units.
- A6 Miss Muffet insists upon consuming 2 units of whey per unit of curds. If the price of curds is 4 and the price of whey is 2, then if Miss Muffet's income is M , her demand for curds will be:
- A $M/4$.
 - B $2M/4$
 - C $4c + 2w = M$.
 - D $4M$.
 - E $M/8$.

A7 Ella's utility function is $u = \min(4x, y)$. If the price of x is 15 and the price of y is 20, how much money would she need to be able to purchase a bundle that she likes as well as the bundle $(x, y) = (5, 8)$?

- A 92
- B 198
- C 190
- D 235
- E 47

A8 A firm has the long run cost function $C(q) = 4q^2 + 4$. In the long run, it will supply a positive amount of output, so long as the price is greater than:

- A 16
- B 24
- C 4
- D 8
- E 13

A9 Daily demand for gasoline at Billy-Bob's Mobile Station is described by $Q = 776 - 200p$ where Q are gallons of gasoline sold and p is the price in Euros. Billy-Bob's supply is $Q = -890 + 1500p$. Suppose the state government places a tax of 20 cents on every gallon of gasoline sold. What is the deadweight loss resulting from this tax?

- A € 3.53
- B € 3.11
- C € 0.42
- D € 96.12
- E € 34.59

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A10 Sir Plus has a demand function for meat that is given by the equation $D(p) = 100 - p$. If the price of meat is 75, how much is Sir Plus's net consumer surplus?

- A 25
- B 312.50
- C 625
- D 156.25
- E 6,000

A11 In East Icicle, Minnesota, on the northern edge of the corn belt, the growing season is short and the soil is poor. Corn yields are meager unless a great deal of expensive fertilizer is used. In Corncrib, Illinois the land is fertile and flat and the growing season is 20 days longer. For any given expenditure per acre, corn yields are far greater than in East Icicle. Farmers in both places are profit maximizers who grow corn. We deduce that:

- A marginal costs are higher in East Icicle than in Corncrib.
- B more fertilizer is used per acre in East Icicle than in Corncrib.
- C marginal costs are the same in both places.
- D more fertilizer is used per acre in Corncrib than in East Icicle.
- E more than one of the above.

A12 Katie Kwasi's utility function is $U(x_1, x_2) = 2 \ln x_1 + x_2$. Given her current income and the current relative prices, she consumes 10 units of x_1 and 15 units of x_2 . If her income doubles, while prices stay constant, how many units of x_1 will she consume after the change in income?

- A 20
- B 18
- C 10
- D 5
- E There is not enough information to determine how much.

A13 If output is produced according to $Q = 4LK$, the price of K is €10, and the price of L is €40, then the cost minimizing combination of K and L capable of producing 64 units of output is

- A $L = 16$ and $K = 1$.
- B $L = 2$ and $K = 8$.
- C $L = 2$ and $K = 2$.
- D $L = 32$ and $K = 32$.
- E $L = 1$ and $K = 16$.

A14 A profit maximizing firm continues to operate even though it is losing money. It sells its product at a price of €100. From these facts we deduce that:

- A average total cost is less than €100.
- B average fixed cost is less than €100.
- C marginal cost is increasing.
- D average variable cost is less than €100.
- E marginal cost is decreasing.

A15 The demand function is described by the equation $q(p) = 210 - p/4$. The inverse demand function is described by:

- A $p(q) = 210 - 4q$.
- B $p(q) = 840 - 4q$.
- C $q(p) = 1/(210 - p/4)$.
- D $p(q) = 1/210 - q/4$.
- E $p(q) = 210 - q/4$.

A16 If the input quantities are $L = 64$ and $K = 4$, the marginal product of factor L for the following production function: $y = L^{0.5} K^{0.5}$ is equal to

- A 0.125
- B 8
- C 0.25
- D 0.5
- E 2

Section B: Free Format

- B1 Sam's utility function is $U(x_1, x_2) = x_1 x_2$, where x_1 is the number of grapefruits consumed and x_2 is the number of grapes consumed. His income is 40, and the prices of grapefruits and grapes are 2 and 4, respectively.
- Show graphically the optimal consumption bundle, Sam consumes. (Name the curves!)
 - Assume that the price of grapes falls to 2. Show the substitution effect and the income effect in the diagram. Explain how you proceed.
- B2 The average variable cost function is given by $AVC(y) = y^2 - 4y + 16$.
- Calculate the marginal cost curve from the average variable cost curve.
 - Graph the short-run supply curve for good y and indicate the calculated minimum price the firm requires to supply a positive amount of the good.
- B3 Long ago, a kindly prince noticed the misery of his subjects. His subjects all had the same preferences and the same low incomes. The demand function of each subject for bread was $q = 26 - p$ where p is the price of bread and q is the number of loaves per week. The supply of bread per capita per week was given by the function $q = 0.3p$.
- Calculate the equilibrium price and number of loaves per week.
 - To allow people to buy more bread, the king declared it illegal to sell bread for more than $p = 10$ per loaf. Explain why a bread shortage is the consequence.
 - The greedy minister of finance told the prince, that if there is a bread shortage anyway, the prince could raise a tax without further reducing the bread production. Calculate the tax.
- B4 For the market of apples you observe an upward sloping supply curve and a downward sloping demand curve.
- Show in an appropriate diagram both the consumer and producer surplus.
 - The government introduces a consumer tax on apples. Explain how such a tax affect consumer and producer rent.
 - Show the deadweight loss in the diagram you used for question a).