Before you start read the following carefully:

➢   The exam has a maximum duration of two hours and fifteen minutes.

➢   The exam has two parts: Part A consists of 12 multiple-choice questions, Part B of three open questions.

➢   Write your answers to Part A in the table below in this page. At the end of the exam separate this sheet from the rest of the exam and hand it in together with your answers to Part B. Make sure you have written your identification in this page below.

➢   You cannot look up any book or any other learning material.

➢   You may use non-graphic calculators but you cannot use graphic calculators**.**

➢   Keep any mobile phone, tablets and pcs switched off**.**

Full name: (as it appears on your student record)			
Student number:		**Class:**	**Degree:**

Part A (6 marks)

Indicate with an 'O' in the table below the correct answer to the questions 1 to 12. You get 0.5 marks for each correct answer and will have a 0.15 deduction for each wrong answer.

At the end of your exam separate this sheet from the rest of the exam paper and hand it in together with your answers to Parts B.

	1	2	3	4	5	6	7	8	9	10	11	12
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)
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)

1. **A point on (not above) or below the production possibility frontier:**

   a) Shows a level of income.
   b) Shows a feasible production combination.
   c) Shows the maximum quantity of one good that can be produced given the quantity produced of the other.
   d) None of the other alternatives is correct.

2. **Which of the following shifts the demand curve for cars to the right?**

   a) A decrease in the price of cars.
   b) A decrease in consumers' income if a car is a normal good.
   c) An increase in the price of cars.
   d) An increase in consumers' income if a car is a normal good.

3. **Coffee and sugar are complementary goods. If the price of coffee falls producer surplus in the sugar market will:**

   a) Remain unchanged.
   b) Rise.
   c) Fall.
   d) It may rise, fall, or remain unchanged.

4. **A price ceiling will have NO effect on the market equilibrium if:**

   a) It is set above the equilibrium price.
   b) It is set below the equilibrium price.
   c) Demand is more elastic than supply.
   d) Supply is more elastic than demand.

5. **The cross price elasticity between two products is found to be -0.4. From this you know that the two products are:**

   a) Normal.
   b) Inferior.
   c) Complements.
   d) Substitutes.

6. **When the price of good X changes the income effect reinforces the substitution effect if and only if:**

   a) X is an inferior good.
   b) X is a normal good.
   c) The price of X increased.
   d) The price of X decreased.

7. **Two goods are perfect complements. Consider two bundles that are on the budget line and on the same indifference curve U_1**

   a) Both bundles are optimal.
   b) We cannot tell which of the bundles is optimal because we do not know the relative price.
   c) The optimal bundle lies on the corner of a higher indifference curve than U_1.
   d) The optimal bundle lies on the corner of curve U_1.

8. **If the short-run marginal cost exceeds the short-run average total cost does the spreading effect outweigh the diminishing returns effect?**

   a) The information is not enough to answer.
   b) No, the diminishing returns effect outweighs the spreading effect.
   c) No, the two effects cancel each other out.
   d) Yes it does.

9. **A monopolist maximises profit when:**

   a) Marginal revenue exceeds marginal cost.
   b) Marginal revenue equals marginal cost.
   c) Marginal revenue is lower than marginal cost.
   d) Price is lower than marginal cost.

10. **Imagine that a previously perfectly competitive market becomes a monopoly. A deadweight loss arises because:**

    a) There's no consumer surplus in a monopoly.
    b) The consumer surplus falls.
    c) The monopolist has abnormally high profits.
    d) The consumer surplus falls by more than the producer surplus rises.

11. **The matrix below shows player 1's and player 2's payoffs (in each cell the number to the left is player 1's payoff). If $r > 3$ and $s > 3$ which of the alternatives below is FALSE?**

		Player 2	
		X	Y
Player 1	Z	4, 5	3, 4
	W	5, r	s, 3

    a) W is a dominant strategy for player 1.
    b) X is a dominant strategy for player 2.
    c) Both players get a payoff higher than 3 in the equilibrium in dominant strategies.
    d) The pair (Z, X) is an equilibrium in dominant strategies.

12. **What profit does the monopolistically competitive firm depicted in the figure below earn?**
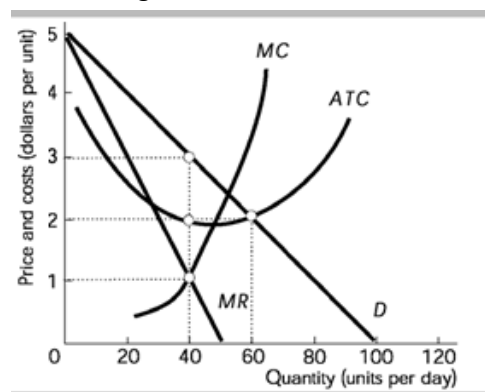
    a) $40 per day.
    b) $80 per day.
    c) $120 per day.
    d) $0.

Part B (14 marks)

1. Countries Alpha and Beta produce goods *X* and *Y* only. Production uses labour only, of which the two countries are equally endowed. The table below shows the maximum quantities the countries can produce of each good if they produce that good only.

Good Country	*X*	*Y*
Alpha	50	30
Beta	30	40

a) Both countries have linear production possibilities frontiers. Draw them in a graph and explain what they mean. [1.25 marks]

b) What comparative advantages do these countries have? Explain and show any calculations you deem necessary. [1.75 marks]

c) Now country Beta manages to double the quantity of good *X* it can produce with any given amount of labour. Draw the country Beta's new production possibilities frontier in your graph (the same graph you drew for part a)), and explain whether comparative advantages have changed. [1.5 marks]

2. In a perfectly competitive market, supply and demand are given by $Q^S = 10 + 2p$ and $Q^D = 50 - 2p$, where Q denotes the quantity and p the price.

a) Find the equilibrium price and quantity. [0.75 marks]

b) Now the government requires sellers to pay a €1 tax per unit sold. Find the new market equilibrium, namely the price paid by consumers, the price net of tax received by producers, and the quantity traded. [1.5 marks]

c) Find the tax revenue and the deadweight loss caused by the tax. [1.25 marks]

d) How is the tax burden shared between buyers and sellers? Explain and give exact numbers. [1.5 marks]

3. A perfectly competitive firm total costs as shown in the table below:

| Quantity	0	1	2	3	4	5	6	7
Total costs, €	63	73	81	87	95	110	132	161

a) Find the marginal cost for each level of output shown in the table, and show them in a table. Show your calculations. Explain whether the firm's operations exhibit the law of diminishing returns. [1.5 marks]

b) The good produced by the firm sells for €15 per unit. How much should the firm produce to maximise profit? What is the firm's profit? Should the firm produce or shut down? Explain. [1.75 marks]

c) Find the firm's shut-down price and break-even price. Explain. [1.25 marks]

Answers to Part A

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

Answers to Part B

Question 1

a) The PPF shows the maximum quantity of one good the country can produce given the quantity produced of the other good. The figure to the right shows Alfa's PPF (thick, gray), the Beta's initial PPF, and Beta's new PPF asked in part c).

b) Initially Alfa has a comparative advantage in good X, and Beta in good Y, as they have absolute advantages in these goods too. Also Alfas opportunity cost of good X is 0.6 units of good Y (30/50, the slope of the PPF), which is lower that Beta's, which is 1.333 (40/3), which again shows Alfa has a comparative advantage in good X. So necessarily Beta has a comparative advantage in good Y.

c) Beta's new PPF is shown in the figure above. Beta's new opportunity cost of good X is now 0.667 (40/60), so still higher than Alfa's, which means the comparative advantages are still the same.
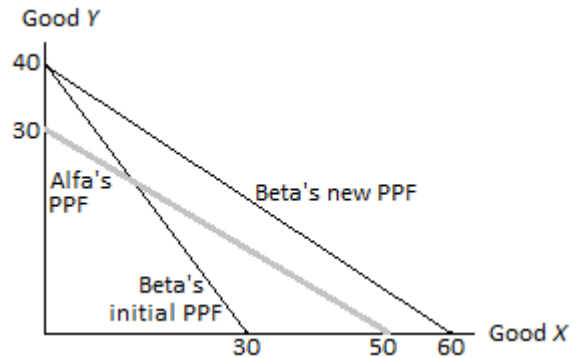
Question 2

a) In equilibrium $Q^S = Q^D \Leftrightarrow 10 + 2p = 50 - 2p \Leftrightarrow 4p = 40 \Leftrightarrow p = 10$. $Q = Q^S = 10 + 2 \times 10 = 30$.

b) After the tax was introduced the consumer price p^D equals the producer price net of tax p^S plus the tax per unit. So in equilibrium $Q^S(p^S) = Q^D(p^D) \Leftrightarrow 10 + 2p^S = 50 - 2p^D \Leftrightarrow 10 + 2p^S = 50 - 2(p^S + 1) \Leftrightarrow 4p^S = 38 \Leftrightarrow p^S = 9.5$; $p^D = p^S + 1 = 10.5$; $Q = Q^S(9.5) = 10 + 2 \times 9.5 = 29$.

c) Tax revenue is unit tax time quantity, so 1 x 29 = 29. The deadweight loss is the consumer and producer surplus lost owing to the reduction in quantity traded, so (drawing the graph would help) 1 x 1/2 = 0.5.

d) The tax caused the consumer price to rise 0.5 from 10 to 10.5 and the producer price to fall by 0.5 from 10 to 9.5; So producers and consumers share the tax burden equally.

Question 3

a) I calculate here the various cost necessary for part c) too, and show them in the table below:

Quantity, Q	0	1	2	3	4	5	6	7
Total costs, TC	63	73	81	87	95	110	132	161
Variable cost, $VC = TC - 63$	0	10	18	24	32	47	69	98
Marginal cost	-	10	8	6	8	15	22	29
Average variable cost = VC/Q	-	10	9	8	8	9.4	11.5	14
Average total cost = TC/Q	-	73	40.5	29	23.75	22	22	23

The law of diminishing returns means that when there is a fixed input the marginal product of the variable input decreases as one uses more and more of it beyond a certain level. As a consequence of this marginal cost will increase beyond that same level. Marginal cost increases with output when the firm produces more than 3 units, so the firm exhibits the law of diminishing returns when it produces more than three units.

b) The firm maximises profit by producing all units with marginal cost not exceeding the price, as long as the price is not less than the average variable cost. So it maximises profit by producing 5 units, with marginal cost equal to price and average variable cost, 9.4, less than the price. The profit is $pQ - TC$ = 15 x 5 – 110 = 75 – 110 = -35. So the firm makes a loss, but it should keep producing 5 units in the short run, for if it produce nothing it would make a bigger loss, -63, i.e. the fixed costs.

c) The shut-down price is 8, the minimum average variable cost, when it produces 4 (or 3) units. If the price is lower the firm should shut down as its revenue would not cover the variable costs, and the loss would be higher than the fixed costs. The break-even price is 22, the minimum average total cost, when the firm produces 6 (or 5) units. When the price is 22 the firm has zero profit, i.e. it breaks even; at lower prices is makes a loss; at higher prices it makes a positive profit.