Resit exam
Part A [10,0]
Duration part A: 50 minutes

Full name: ………., **Version A**

Student number: ……………………………………………… Class: ………………………………………

1. Indicate your answer with an "O" in the Answer Table below. Each correct answer is worth 0.625 points, and each wrong answer has a penalty of 0.625/3 ($\approx$0.208) points.

2. No consultation of any kind is allowed. Teachers will not provide explanations.

3. Turn off any cell phones, computers, or tablets, and keep them away from the table.

4. Return this sheet to the teacher even if you withdraw from the exam.

ANSWER TABLE

	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. In a market that consists of a single firm, in equilibrium, the marginal revenue is 20 (in monetary units) and the price elasticity of demand is -1.5. The price is:
   a) 60.
   b) 12.
   c) 20.
   d) None of the other answers are correct.

2. A monopolist sells his product at a price of €5 in markets 1 and 2. At this price the elasticities of demand are ε_1 = -1.2 and ε_2 = -1.5. If the firm can practice third-degree price discrimination, it is certainly possible to increase profits by:
   a) Increasing the price in both markets.
   b) Increasing the price in market 1 and decreasing the price in market 2.
   c) Increasing the price in market 2 and decreasing the price in market 1.
   d) Lowering the price in both markets.

3. With perfect price discrimination (to the first degree), we have that marginal revenue:
   a) Is higher than the price.
   b) Is equal to the price.
   c) Is lower than the price.
   d) Is greater than, equal to, or less than the price depending on whether the price elasticity is greater than or equal to 1.

4. Two duopolists with cost functions $c_1(y_1)=y_1^2$ and $c_2(y_2)=4y_2$ and the inverse demand curve $p(y)=20 - y$, where $y=y_1 + y_2$, maximize joint profit when:
   a) $y_1 = y_2 = 8$.
   b) $y_1 = y_2 = 4$.
   c) $y_1 = 8, y_2 = 4$.
   d) $y_1 = 2, y_2 = 6$.

5. In the Stackelberg model, which firm maximizes its profit given the amount produced by the other?
   a) Only the leader.
   b) Only the follower.
   c) The leader and the follower.
   d) Neither the leader nor the follower.

6. The Stackelberg model is a game in which firms:
   a) Choose quantities simultaneously and independently.
   b) Choose quantities simultaneously and jointly.
   c) Choose quantities sequentially.
   d) None of the answers are correct.

7. The pareto-efficient (cooperative) solution is more likely to be obtained in a "prisoner's dilemma" game when:
   a) The game is repeated an infinite number of times.
   b) The game is repeated a known finite number of times.
   c) The game is played once.
   d) It is not possible to obtain the pareto-efficient (cooperative) solution in a "prisoner's dilemma" game.

8. Consider a simultaneous game between player A and B. A has two possible strategies: A1 and A2. B has two possible strategies: B1 and B2. If A1 is A's best response when B chooses B1, then:
   a) A1 is necessarily a dominant strategy for A.
   b) A2 cannot be a dominant strategy for A.
   c) B will choose strategy B1 in any Nash equilibrium.
   d) None of the alternatives are correct.

9. Consider the following two sets of solutions to a non-cooperative game that is played simultaneously: (i) "the set of all Nash equilibria" and (ii) "the set of equilibria in dominant strategies". What is the relationship between these two sets?
   a) The two sets do not contain any overlap.
   b) The set of all Nash equilibria is a subset of the set of equilibria in dominant strategies.
   c) The two sets are identical.
   d) The set of equilibria in dominant strategies is a subset of the set of all Nash equilibria.

10. Ana prefers a lottery with an expected value of €900 over a certain amount of €800. This indicates that Ana is:
    a) Risk loving.
    b) Risk neutral.
    c) Risk averse.
    d) None of the answers are correct.

11. Ana has an initial wealth of €10.000 and a 10% probability of losing €2.000. The actuarially fair premium for a full insurance is:
    a) €200.
    b) €800.
    c) €1.000.
    d) None of the answers are correct.

12. Moral hazard is best described by:
    a) Someone starts engaging in risky behaviour after buying insurance.
    b) An insurance company sells life insurance without recognizing that the policyholder's lifestyle presents a greater risk than the one used to calculate the premium.
    c) There are several drugs for weight loss on sale, but consumers cannot distinguish the effective ones from the ineffective ones.
    d) A health insurance company bases the premium on the average probability of getting sick in the whole population, and so the healthy do not find it worthwhile to get insurance.

13. If a used car dealer offers a warranty on a second-hand car, then buyers believe that car is of good quality if:
    a) The cost of providing a warranty for a poor-quality car is too high.
    b) All cars get such a warranty.
    c) All bad-quality cars get such a warranty.
    d) The warranty is a false signal.

14. A public good is:
    a) Rival and exclusive.
    b) Non-rival and exclusive.
    c) Rival and non-exclusive.
    d) Non-rival and non-exclusive.

15. The efficiency condition in the production of a good that generates external costs is that:
    a) Private marginal benefits equal private marginal costs.
    b) External marginal costs equal social marginal costs.
    c) Private marginal benefits equal social marginal costs.
    d) There is no efficiency condition with external effects.

16. The existence of negative externalities in the production of a good implies:
    a) That producers are penalized, but consumers are not.
    b) Excessive production of the good.
    c) The demand will be too high.
    d) The market continues to maximize social welfare.

Resit exam
Part B [10,0]
Duration part B: 70 minutes

1. There is no need to write your answers to the different questions on different sheets.

2. Write your name and student number on each sheet.

3. No consultation of any kind is allowed. Teachers will not provide explanations.

4. Turn off any cell phones, computers, or tablets, and keep them away from the table.

Question 1 [4,0]

Note: the sub-questions are independent.

a) The company "CC" is the only one operating in a market. Her marginal cost function is $MC(Y) = 4 + 0.5Y$. The inverse of the market demand function is $p(Y) = 10 - Y$. Calculate, compare, and comment on the consumer surplus and producer surplus in each of the following three situations: (i) the compony charges the price that is consistent with perfect competition; (ii) the company acts as a monopolist that cannot price discriminate; (iii) the company acts as a monopolist that uses perfect (first-degree) price discrimination. [1,5]

b) The companies "KK" and "LL" are the only two companies in a market. They compete by choosing their prices simultaneously and do not form a cartel. The inverse of the market demand function is $p(Y) = 100 - 50Y$. The total production costs of each firm are identical and equal to $c(Y) = 10Y$. Determine the equilibrium price in this market and the quantity each firm will sell. Justify your answer. [1,5]

c) True or false? "*The long-run equilibrium of a monopolistically competitive market is Pareto inefficient.*" Explain. [1,0]

Question 2 [3,0]

Note: the sub-questions are independent.

a) Guilherme's wealth consists of a portfolio of shares that will have a value of €10.000 or €3.600, each with 50% probability. His preferences are described by the following utility function: $u(w) = w^{1/2}$, where w is the level of wealth. What is the minimum amount for which Guilherme would be willing to sell his stock portfolio? [1,5]

b) In the country "DD", 40% of the individuals are healthy and 60% are unhealthy. For both groups, the probability of getting sick is 50%. In case they get sick, however, the health costs are €2,000 for the healthy and €8,000 for the unhealthy. Individuals are risk averse, with healthy people willing to pay up to €1,200 and unhealthy people up to €4,500 for insurance that fully covers their health expenses. Insurers are willing to offer full insurance at a price that guarantees non-negative profits. That is, insurers are willing to charge an actuarially fair premium. However, insurers cannot distinguish healthy from unhealthy individuals. Explain what the equilibrium in this market will be, and whether there will be adverse selection. [1,5]

Question 3 [3,0]

Consider the market for a product Q, which is produced under perfect competition. The inverse demand function for this product is given by $p(Q) = 3 - Q$. The inverse supply function is given by $p(Q) = 2Q$. There are external costs (pollution) associated with the production of Q. The external marginal costs are given by the following function: $EMC(Q) = 0$ if $Q \leq 2$ and $EMC(Q) = 2Q - 4$ if $Q > 2$.

a) Use the equality between the private marginal benefit (*PMB*) and social marginal cost (*SMC=PMC+EMC*) to determine the socially optimal quantity of production Q. Explain your results and illustrate it graphically. [1,5]

b) Does achieving the social optimum in this market require government intervention? If yes, how and to what extent? [1,5]

Multiple choice – version A

    1. a

    2. b

    3. b

    4. d

    5. b

    6. c

    7. a

    8. b

    9. d

    10. d

    11. a

    12. a

    13. a

    14. d

    15. c

    16. b

Open questions

1.a.

<u>Concorrência perfeita:</u>

$$p(Y) = 10 - Y; CMg(Y) = 4 + \frac{1}{2}Y;$$

Y* : p(Y) = CMg(Y) $\rightarrow$ $10 - Y = 4 + \frac{1}{2}Y$ $\rightarrow Y* = 4$. Logo p* = 6, $EC = \frac{(10-6)\times 4}{2} = 8, EP = \frac{(6-4)\times 4}{2} = 4$ e $ES = EC + EP = 12$. Os excedentes são máximos nesta situação.

<u>Monopólio não -discriminante:</u>

Y* : RM(Y) = CMg(Y) $\rightarrow$ $10 - 2Y* = 4 + \frac{1}{2}Y*$ $\rightarrow Y* = 2.4$. Logo p*(Y* = 2.4) = 7.6, EC = 2.88, EP = 7.2 e ES = 10.08.

Nesta situação a quantidade vendida diminui e o preço aumenta (poder de mercado). Em consequência o EC diminui porque os consumidores compram menos quantidade a preços mais elevados. O EP aumenta por causa do aumento de preço. O ES diminuiu porque se vende menos.

<u>Monopólio discriminante de 1º grau:</u>

Y* : RM(Y) = CMg(Y) sendo agora $RMg(Y) = p(Y) = 10 - Y$. Logo Y*: $10 - Y = 4 + \frac{1}{2}Y \rightarrow Y* = 4$ que é a quantidade vendida pela empresa na ótica da concorrência perfeita. Cada uma das 4 unidades vai ser vendida ao respetivo preço de reserva, pelo que o EC é nulo sendo totalmente capturado pela empresa. O EP = 12 e o ES = 12. Note-se que, apesar de o ES ser máximo nesta situação tal como acontece na situação de concorrência perfeita, ele não é justo porque é obtido à custa do sacrifício do EC.

1.b.

As empresas concorrem à Bertrand (concorrem pelos preços que são escolhidos simultaneamente) e têm custos marginais iguais. Logo o preço de equilíbrio é igual aos custos marginais. Logo Y * : p(Y*) = CMg (Y*) $\Rightarrow$ 100 – 50Y* = 10 $\Rightarrow$ Y* = 18, p* = 20 e $y_{kk} = y_{LL} = 9$.

1.c.

No longo prazo, o lucro económico das empresas é nulo tal como em concorrência perfeita. Porém, o preço de venda é superior ao custo marginal das empresas, existindo ainda excesso de capacidade instalada, porque cada empresa produz um output inferior ao output eficiente que minimiza os custos médios de produção.

Seria possível, com lucro zero, produzir mais com menos empresas e praticar um preço mais baixo e próximo do custo marginal. Este é o argumento para a ineficiência à Pareto.

2.a.

O produto da venda, *x*, tem de ter utilidade pelo menos igual à utilidade esperada da carteira de ações: $u(x) \geq 0.5u(10000) + 0.5u(3600) \Leftrightarrow x \geq 6400$.

2.b.

Se todos comprarem seguro, uma seguradora cobre as indemnizações esperadas se cobrar pelo menos 0.4 x 0.5 x 2000 + 0.6 x 0.5 x 8000 = 2800. A este preço, os saudáveis não compram. Logo, há um equilíbrio em que só os não saudáveis compram seguro — há portanto seleção adversa — e o preço será entre €4000 (mínimo que garante lucros esperados não negativos à seguradora) e €4500.

3.a.

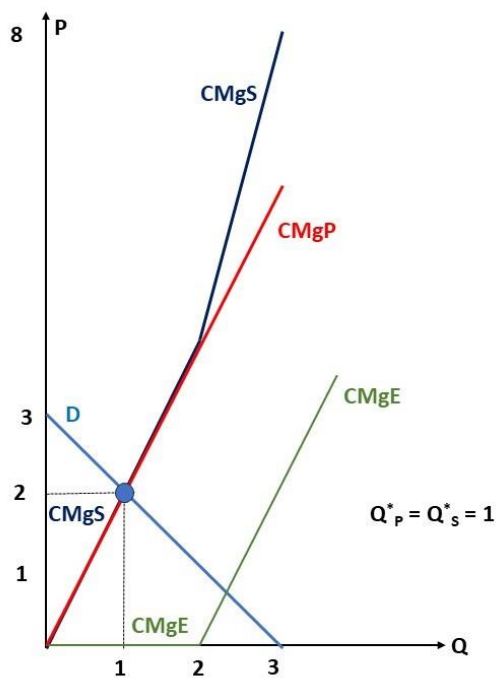CMgP = 2Q ; CMgE = -4 + 2Q se Q>2 e CMgE=0 se Q<=2 ; BMgP = 3-Q

$$CMgS \ = \ CMgP \ + \ CMgE = \begin{cases} 2\,Q & se\ Q \le 2 \\ 4Q - 4 & se\ Q > 2 \end{cases}$$

Igualando o BMgS ao CMgS nos dois ramos temos:

No ramo1: $2q = 3\text{-}Q$ ➔ Q=1

No ramo2: $4Q\text{-}4 = 3\text{-}Q$ ➔ Q=1,4 < 2   não Admissível

O ótimo social corresponde a Q*=1.

3.b.

O ótimo privado é dado pela igualdade entre o CMgP = BMgP ou seja

$$CMgP = BMgP \ \ \rightarrow \ \ 2Q = 3 - Q \ \ \rightarrow \ \ Q_P^* \ = 1$$

O ótimo privado é igual ao ótimo social pelo que o Estado não tem nenhuma razão para intervir.