**-MICROECONOMICS 2018-2019 exam of 29-01-2019**

**Full name: N° ‘matricola’:**

*- Time: 70 minutes (50 minutes for students taking the second partial test).*  **Any answer not justified by calculations, graphs or whatever, will not be considered.**Use the present sheet for calculations, graphs and any other observation.

**1a.** In a Cournot duopoly the inverse market demand is $p=180-y$. Firms 1 and 2 have zero marginal cost. Determine firm’s reaction functions, represent them in the space $(y\_{1},y\_{2})$, and use them to compare the Cournot equilibrium with the equilibrium produced by quantity leadership.

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**1b.** Anna's wealth consists of a lottery ticket L, paying prize L1 = 900 with probability 1/2, and prize L2 = 100 with probability 1/2. Her utility function for sure wealth is UA = $4w^{1/2}$, and her preference for contingent consumption satisfies the expected utility property. Determine the *minimum* price *p* at which Anna is prepared to sell the ticket L (the certainty equivalent of L).

1. $p=600$
2. $p=400$
3. $p=300$
4. $p=200$
5. every other answer is wrong

**2a. Explain why, if consumer’s money income is given, a *normal good* is necessarily an *ordinary good*, but the reverse may not hold.**

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**2b.** A consumer buys only two goods, x and y. Initially, at prices [2,1], the consumer chooses the basket (2, 4). When prices change and become [1,2], the consumer chooses the basket (4, 2). Then it is possible to state that:

a) consumer’s choices violate the weak axiom of revealed preference (WARP)

b) consumer’s choices do not violate the weak axiom of revealed preference

c) without knowing preferences, it is impossible establishing if consumer’s choices do, or do not, violate WARP

d) none of the other statements is correct

**3a.** An economy consists of two agents A, and B, sharing a room for 20 hours a day, and having endowments of a consumption good *c* $W\_{c}^{A}=W\_{c}^{B}=60$. A loves singing (*M*), while B loves silence (*S*); their preferences are represented by $u\_{A}=12logM+2c $, $u\_{B}=18logS+2c.$ Taking into account that *M + S* = 20, determine the Pareto efficient distribution of time between singing and silence, and represent the *contract curve* in the Edgeworth box of this economy.

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**3b.** A competitive industry has market demand $y=1680-2p$. Each firm has cost function $C(0)=0$; $C\left(y\right)=400+y^{2}$, if y > 0. Determine the long-period number *n* of firms in the industry.

1. 200
2. 150
3. 120
4. 80
5. 40
6. Every other answer is wrong

**4a.** Explain what is a ‘public good’. Next, consider an economy in which 2 agents A, B consume a public good G, and a private good *x*, supplied at constant market prices pG = 2, *px* = 10. A and B have utility functions $u\_{A}\left(G,x\right)=12logG+x$ , $u\_{B}\left(G,x\right)=3logG+x$, respectively. Define the Pareto efficient quantity G.

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**4b.** A consumer has utility function $u\left(x,y\right)=2x^{1/2}+y$. Her income is *m* = 120, and the prices of goods are [1, 10], respectively. If the price of good x increases at *px* = 2 (with the price of y fixed at *py* = 10), what can you say about the substitution effect for good x?

a) Δxs = − 25

b) Δxs = − 60

c) Δxs = − 75

d) Δxs = − 45

e) it is equal to the income effect

f) every other answer is wrong

**5a. A’s and B’s preferences for consumption bundles (*x*, *y*) are represented by *uA*(*x, y*) =** $x\_{A}^{1/3}y\_{A}^{2/3}$ **and *uB*(*x, y*) =** $x\_{B}^{1/2}y\_{B}^{1/2}$ **Their endowments of goods are (4, 2) for A and (2, 4) for B. Do agents A and B have an incentive to exchange goods between them? Describe the situation using Edgeworth’s box.**

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**5b.** Agent A wealth is W1 = 0 if state 1 occurs, and W2 = 16000 if state 2 occurs. State 1 and 2 occur with probability 1/5, and 4/5, respectively. A can ensure wealth K, 0 ≤ K ≤ 16000, paying an insurance premium γK , where the premium per unit insurance is γ = 1/4. A's utility for non-contingent consumption is $u\_{A}\left(c\right)=24c+6$. A's preferences for contingent consumption satisfy the expected utility property. Explain why the amount of insurance K chosen by A must satisfy one and only one among the following properties:

a) K = 0

b) 0 < K < 16000

c) K = 16000

d) none of the other answers

**6a.** A lender offers loan contracts (including the limited liability clause) to finance projects of size L=200 and producing a positive cash flow in case of success, and zero cash flow in case of failure. The risk-free interest rate is $r=0.1$. Projects are of type A or B, with success probabilities $α\_{A}=0.8, α\_{B}=0.6$, and expected cash-flows $EV\_{A}=900, EV\_{B}=800$; project frequencies are $p\_{A}=0.5$ , $p\_{B}=0.5$. Assuming that project type is hidden information, determine the minimum risk adjusted interest factor $(1+r\_{L})$ that meets the lender’s participation constraint, and discuss if adverse selection will or will not occur, and why.

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**6b.** A competitive firm has production function $y=\frac{1}{4}x\_{1}+\frac{1}{3}x\_{2}$. Factor prices are w1 = 10, w2 = 10, respectively. Determine the average-cost function AC(y)

a) AC = 30

b) AC = 24

c) AC = 12

d) AC = 40

e) AC = 36

f) every other answer is wrong