Economia Industriale

Exam ?? ?? 20?? - 6 CFU -

NAME _____ FAMILY NAME _____

Registration number _____

Those who submitted the problem set 1 and 2 and did the presentation in class have to solve parts A and B (total points 20/20). Total time 60 minutes. The other students have to solve also part C. Total time 90 minutes

Part A - Assign 10 points over 30

Question A.1 For the case of a duopoly consider the following equation:

$$\max_{a_1,a_2} \lambda\pi_1(a_1,a_2) + (1-\lambda)\pi_2(a_1,a_2) \tag{1}$$

where $0 \leq \lambda \leq 1$ is a weight on profit of the two firms and a_i are the actions of each firms.

A.1.1 What is the interpretation of the above equation ? [1 point]

A.1.2 In case $\lambda = 1/2$ what will be the market equilibrium? [1 point]

A.1.3 Derive the direct and cross effects of one firm strategy on profit of the other firm [3 points]

Question A.2 Sara wants to buy a smartphone. After evaluating many of them she is undecided about two models, HLite and Kwide, whose characteristics are summarised in the following table. Thanks to a chat with a friend she realised she is willing to pay 8 euros per inch of the display, 5 euros per hour of battery duration and 20 euros per Gb of RAM.

	Display width	Battery duration	RAM	Price
Hlite	5 inches	15 h	3 Gb	150 euros
Kwide	6 inches	20 h	4 Gb	220 euros

A.2.1 Compute Sara's gross utility for each smartphone and fill appropriately the table [3 points]

	Display width	Battery duration	RAM	
SARA's Willigness to pay in euros	8	5	20	
				Gross utility
Hlite utility				
Kwide utility				

A.1.2 Which smartphone Sara will buy and why? [2 points]

Part B - Assign 10 points out of 30

Question B.1 Braghetton is a firm organized as a chain stores in franchising. It offers two types of contracts to its franchisee affiliates. The first contract envisages that the franchisee in a given town, in case of entry of a competitor in that town, has to engage a price war (NA) instead of accomodate entry (A). In case the franchisee does not engage the price war the contract envisages she has to pay a 40 (thousands euros) penalty (P). Alternatively, the other contract is without penalty. Suppose now that Braghetton Sassari (Bss) is the only one shop in Sassari, but Mutandonia (Mss) is likely to enter the market in the town. In case Bss signs the contract **without penalty (NP)** and Mss does not enter (NE) then Bss profit is 50 (thousands euros) ($\Pi_{bss} = 50$) and Mss is at zero profit. If Mss enter then Bss can engage a price war (NA) and profit are $\Pi_{Bss} = \Pi_{Mss} = -10$ for both firms. In case it accomodates (A) the profit are $\Pi_{Bss} = 20$ e $\Pi_{Mss} = 10$.

In case of the **contract with penalty** if Mss does not enter profit for both are as above ($\Pi_{bss} = 50$ e $\Pi_{Mss} = 0$). If Mss enter and Bss does **not engage** a price war (A) then with the penalty profit for Bss is $\Pi_{Bss} = -20$

B.1.1 Draw the decision three of this game [2 points]

B.1.2 Find the subgame perfect equilibrium in the case of the contract without penalty and in case of a contract with penalty explaining how you obtain the results. [2 points]

B.1.3 Find the subgame perfect equilibrium for the entire game, i.e. whether or not it is better for Bss signing the contract with penalty or without penalty [1 point]

Domanda B.2 Consumers of extra virgin oil in Sassari are willing to pay up to a maximum of 10 euros per litre. In the countryside around Sassari there are 70 sellers of olive oil with no capacity constraints (i.e. one seller can serve the whole market). If consumers want to gather information about all sellers prices for the current year they should pay a monetary and non-monetary cost of 5 euros.

B.2.1 Suppose that 69 sellers set a price of 8 euros and just one sets a price of 4 euros, should the 69 sellers reduce their price to survive in the market? Explain how you obtain the result. [2 points]

B.2.2 What will most likely be the final equilibrium price? Explain. [3 points]

Parte C - Assegna 10 punti su 30

The antiparasitic *HitWeevil* is produced by a monopolist **Vanquish** with total cost equal to $TC = cq$ and $c = 20$. Demand function for antiparasitic is $p = 100 - \frac{1}{4}q$.

Thanks to the information elaborated by the market analysts contracted by Vanquish we know that there is a probability $(1 - \rho)$ that a competitor **Outfight** might enter the market. In order to prevent entry Vanquish could engage an aggressive price war, reduce the price and obtain losses equal to $L = 2000$ in the first period, and profit in the following periods depending on entry decision of Outfight. We are asked to help Vanquish to compute for what value of probability ρ it is optimal engage a price war. Let's proceed step by step.

C.1 What is the monopoly profit of Vanquish? [2 points]

C.2 What would be the quantity produced and the equilibrium price in a duopoly with Outfight in case of a Cournot competition? [3 points]

C.2 What would be the profit for each of the duopolists? [2 points]

C.3 For what level of ρ it would be optimal to engage a price war for Vanquish? [3 points]