Problem 1

Answer: Yes

This problem is very similar to Problem 1 of Quiz 4. The interpretation is different, but the values are the same. As a consequence, the conclusion is the same: the monopolist should attack the entrant. Equivalently, British Telecom should attack London Calls.

Problem 2

Answer: No

Problem 3

Answer: Sony receives payoffs of €4 mn / Philips receives payoffs of €2 mn

Sony will be ready first. Consequently, this firm will adopt its own standard. According to the payoff table, this leads to a payoff of €4 million for Sony. At this point, the best reply by Philips is to also adopt its competitor's standard. If we assume that Philips is a rational player, then it will choose its best strategy. As a result, its payoff will be €2 million.

Problem 4

Answer:

- ▷ A monopolist in a market will consider deterring entry if this strategy changes the entrant's expectations about the nature of post-entry competition.
- ▷ Judo Economics can only be successful if the entrants signal the incumbents that they do not intend to increase their capacity drastically in the future.
- ▷ Firms which are direct competitors can also be complementors.
- ▷ In repeated interactions between companies, cooperation is more likely if ceteris paribus future payments are more important.

Problem 5

Answer:

- ▷ In a Nash Equilibrium, any individual player cannot gain from unilaterally deviating from its strategy when all other players are playing their assigned strategies.

Problem 6

Answer:

- ▷ Yes. You could now decrease the price for your game console and sell more devices which raises demand for the sports game. This cross-subsidizing strategy may maximize the overall profits of the combined company.
- ▷ Yes. You could now sell your console exclusively in a package with the sports game. Assuming that there is low competition for video consoles and high competition for video games, this increases the sales for the sports game and hence maximizes the overall profits of the combined company.

Problem 7

Answer:

- ▷ ... Burger King could focus on offering beef burgers whereas McDonalds only sells chicken burgers. This is called horizontal differentiation.

▷ ... Burger King could sell premium burgers from organic sources whereas McDonalds offers ordinary burgers of standard quality. This is called vertical differentiation.

Problem 8

Answer: Coca Cola will deviate / Pepsi will deviate

For the sake of clarity, first we construct the payoff table for this game. To do so, let us summarize the information we were given in the problem statement. Every value will be expressed in units of €1 k.
▷ Cooperation from both companies: Each company gets half of 855.
▷ Non-cooperation from both companies: Each company gets 180.
▷ One company cooperates, the other deviates: the cooperating company gets 160, and the deviating company gets 530.
Then the payoff matrix for this game is

Coca Cola \ Pepsi	Cooperate	Deviate
Cooperate	$\frac{855}{2}$ / $\frac{855}{2}$	160 / 530
Deviate	530 / 160	180 / 180

It's useful to know that $\frac{855}{2} = 427.5$. First, consider the best reply by Pepsi for each strategy of Coca Cola:
▷ Coca Cola cooperates: Pepsi deviates;
▷ Coca Cola deviates: Pepsi deviates.
Hence deviating is a dominant strategy for Pepsi. Next, consider the best reply by Coca Cola for each strategy of Pepsi:
▷ Pepsi cooperates: Coca Cola deviates;
▷ Pepsi deviates: Coca Cola deviates.
This means that non-cooperation is also the dominant strategy for Coca Cola. If we assume both players are rational, then each player will choose its dominant strategy. In other words, both companies will decide to deviate.

Problem 9

Answer:
▷ In special situations monopolists can have high incentives to invest in R&D.
▷ The value of innovation can be higher for firms in a competitive market than for a monopolist.

Problem 10

Answer:
▷ $15p - 10p^2 - 10$
▷ $p(1-p) \cdot 15 + 5p^2 - 10$

We begin by summarizing the relevant information:
▷ For A, the fixed R&D costs are \$10 million;
▷ If only one company is successful, then its payoff will be \$15 million;
▷ If both companies succeed, then the payoff for each firm will be \$5 million;
▷ The probability of success for A or B is p.
Next, assume both companies engage in R&D. In this case, the expected payoff for A can be written as

$$P_A = 15p(1-p) + 5p^2 - 10 = p(1-p) \cdot 15 + 5p^2 - 10.$$

Equivalently, we can write the following:

$$\begin{aligned} P_A &= 15p(1-p) + 5p^2 - 10 \\ &= 15p - 15p^2 + 5p^2 - 10 \\ &= 15p - 10p^2 - 10. \end{aligned}$$

Problem 11

Answer:
▷ ... the description of the actions a player will undertake in any possible circumstance.

Problem 12

Answer: ... to make a sunk investment.

Problem 13

Answer: True

Problem 14

Answer:
▷ ... A increases the users' utility from B.
▷ ... B increases the users' utility from A.
▷ ... the demand for A increases when the price of B drops.
▷ ... the demand for B increases when the price of A drops.

Problem 15

Answer:
▷ ... changing the entrant's expectations about post-entry competition.

Problem 16

Answer:
▷ ... products are sufficiently differentiated.

Problem 17

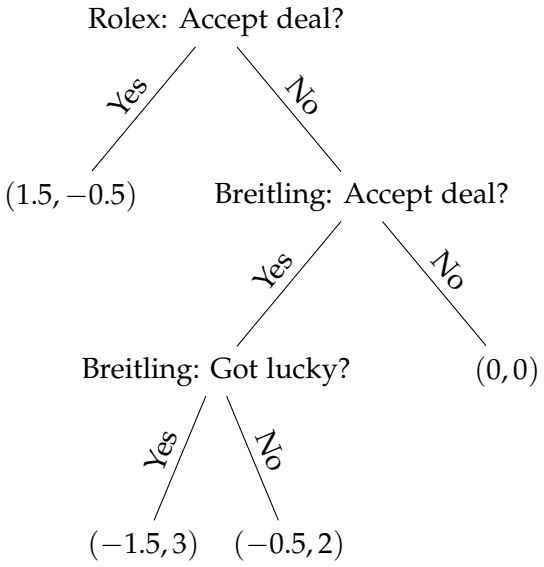
Answer: Yes, the profits of both companies increase.

A similar case was discussed in one of the lectures. When the separation between the stalls increases, this leads to reduced price competition. As a result, both companies earn larger profits.

Problem 18

Answer: Yes

To answer this question, the first step is to draw the game tree for this sequential game. This tree is shown below. Its leaf nodes contain the payoffs for Rolex and Breitling in the form (p_R, p_B), where p_R and p_B denote the changes in gross profits for Rolex and Breitling, respectively. Notice that these values are expressed in units of £1 million.



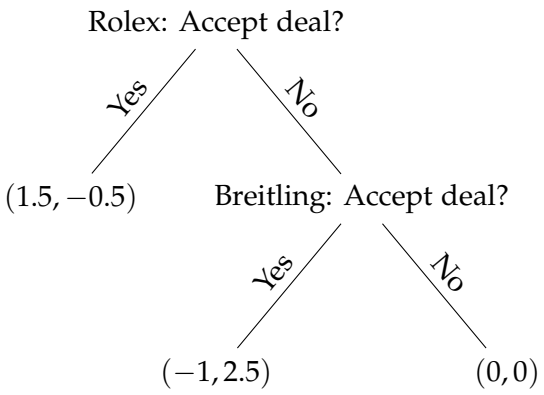
This game has an element of uncertainty. When Breitling accepts the deal, this company can get lucky. But we don't know for sure if that's going to happen. We only know the corresponding probability: $p = 0.5$. To be honest, I'm not sure about how to deal with this kind of game. Perhaps I'm wrong, but I believe the lectures don't cover this topic. So I'll adopt the approach that seems most reasonable to me. Specifically, I'm going to replace the sub-tree rooted at "Breitling: Got lucky?" with a leaf node. This node will contain the expectation values of the payoffs for Rolex and Breitling. For Rolex, this expectation value can be computed as follows:

$$\begin{aligned} E[p_R] &= (-1.5)p + (-0.5)(1-p) \\ &= -1.5p - 0.5(1-p) \\ &= -1.5p - 0.5 + 0.5p \\ &= -p - 0.5 \\ &= -0.5 - 0.5 \\ &= -1. \end{aligned}$$

Similarly, for Breitling we can write the following:

$$\begin{aligned} E[p_B] &= 3p + 2(1-p) \\ &= 3p + 2 - 2p \\ &= p + 2 \\ &= 0.5 + 2 \\ &= 2.5. \end{aligned}$$

By using these results, we can draw the new game tree:



Next, we apply backward induction to determine the outcome of this game. We begin by analyzing the sub-tree rooted at "Breitling: Accept deal?". From Breitling's perspective, the choice is between making no additional profit or increasing its profit by £2.5 million. Then, if this company has the chance, it should accept the deal. Finally, consider what Rolex should do. If this company does **not** accept the deal, then its competitor will. In

this case, Rolex loses money: its gross profit decreases by £1 million. On the other hand, if this firm accepts the deal, it will earn an additional profit of £1.5 million. This makes it clear that, for Rolex, the best option is to accept the deal. As the CEO of this company, that's exactly what I would do.

Problem 19

Answer: False

This question is very similar to the first question of Quiz 1. In the solution to that quiz, we concluded that a Nash equilibrium with dominated strategies cannot exist.

Problem 20

Answer:
▷ Limit pricing means that firms are bound to a price cap introduced by the competition authority.

Problem 21

Answer:
▷ Perfect market transparency
▷ No capacity constraints
▷ Infinite price elasticity
▷ Identical products

Problem 22

Answer: False

Problem 23

Answer: False

Problem 24

Answer: . . . it affects the elasticity of demand of the focal product.

Problem 25

Answer: Pizza Hut - Medium Price / Domino's Pizza - Medium Price

First, consider the best reply by Pizza Hut for each strategy of Domino's Pizza:
▷ Domino's Pizza charges a High price: Pizza Hut charges a High price;
▷ Domino's Pizza charges a Medium price: Pizza Hut charges a Medium price;
▷ Domino's Pizza charges a Low price: Pizza Hut charges a Medium price.
Next, consider the best reply by Domino's Pizza for each strategy of Pizza Hut:
▷ Pizza Hut charges a High price: Domino's Pizza charges a Medium price;
▷ Pizza Hut charges a Medium price: Domino's Pizza charges a Medium price;
▷ Pizza Hut charges a Low price: Domino's Pizza charges a Low price.
This makes it clear that this game has a Nash equilibrium characterized by both companies charging a medium price. Since the two players are rational, the outcome of this game corresponds to this Nash equilibrium.