MICROECONOMICS

FINAL EXAM STUDY COMPANION FOR

60A201
Fall 2017-18

Prepared by Benedek NAGY PhD

Book: Hal R. Varian: Intermediate Microeconomics (8th Ed.)

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Preface

My aim with this study guide is to make preparation for the final exam easier for the students. All the necessary knowledge they need to successfully finish their microeconomics course is in the book, in the lecture slides or have been told during lectures. Here they can get a little more proficient with the types of questions that are going to be asked during the final exam.
For every topic first you will find the definitions. These definitions mostly come from the book, but some have been slightly modified by me. These are not the only possibly good definitions of the concepts listed, students can come up with their own variations, but I am going to decide in the end, whether it is a correct definition or not.
Second, you will find true or false questions, then single choice questions. Statements that are partly true are actually false "A bear is a carnivore mammal that can fly" is obviously false, although the first half of the sentence is true. For the single choice there is only one totally correct answer, though more of them can partially be right.
After the questions for every topic you will find the solutions to the questions and also detailed explanation supplementing the solution. Also you will find a detailed definition list, where the basic definition is accompanied by some further explanation to make the definition easier to understand and memorize. You will not need to give these explanations in the exam.
You will find essay questions too, where you will have to answer longer than the definition, with your own words, as in the real life this the way you will have to show you know economics.
I recommend, that after you feel fully prepared for the final exam, sit down with the sample test at the end of this study guide, set your timer to 55 minutes (that is how much time you will have at the real test) and try to solve it as good as you can. Only check the answers after the 55 minutes are up to see how well you are doing under a time constraint.

This course contributes to the professional training of the students in the following ways:

a) regarding the knowledge of the student:
- has a firm grasp on the essential concepts, facts and theories of (micro)economics. The student is familiar with the economic actors, their individual behaviour and their interconnectedness;
- is familiar with the concepts and methods of analysing the processes of production and marketing at a firm, preparing and supporting decisions;
- is aware of the connection of other professional fields to the field of microeconomic decisions (engineering, law, environmental protection, accounting, market research etc.);
- is familiar with digital and other office appliances designed to aid economic processes and the effective operation of economic organisations;
- Has mastered the professional and effective usage of written and oral communication along with the presentation of data using charts and graphs;
- Has a good command of the basic linguistic terms used in microeconomics in English.

b) regarding the competencies of the student:
- is familiar with and able to apply the concepts of optimizing and equilibrium in reasoning about, predicting and organizing economic activity;
- can uncover facts and basic connections, can arrange and analyse data systematically, can draw conclusions and make critical observations along with preparatory suggestions using the theories and

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methods learned.
- The student can make informed decisions in connection with routine and partially unfamiliar issues applying the economic way of thinking;
- Follows and understands international and world economy events along with the changes in the relevant economic policies and laws and their effect at the microeconomic actors' level. The student considers the above when conducting analyses, making suggestions and proposing decisions;
- Is capable of assessing the complex consequences of economic processes and organisational events on consumer and producer decisions;
- Can present conceptually and theoretically professional suggestions and opinions well both in written and oral form in English;
- Is an intermediate user of professional vocabulary in English.

c) regarding the attitude of the student:
- Is open to new information, new professional knowledge and new methodologies;
- Is sensitive to the changes occurring to the wider economic and social circumstances of his/her job, workplace or enterprise. The student tries to follow and understand these changes within the framework learned;

d) regarding autonomy and responsibility, the student
- Takes responsibility for his/her analyses, conclusions and decisions;
- Organises, leads and assesses economic activities in an firm or an economic institution;

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Topic 1: The Market Mechanism
(Chapter1)

Topic overview

The first of our micro topics is that of the market mechanism. The market mechanism is one way how those who don't have the goods but need them and want to have them and those who have them but not so much need them interact. Those who produce the goods (firms) and those who will eventually consume them (households, consumers) do not know each other personally, maybe do not even know about each other's existence. These two sides have to interact somehow with each other, because we have to find out somehow, how much of the different goods need to be produced and who should have them.

One way to do that is to have a market between the two sides, where potential buyers and sellers can meet and interact. The market is generating price signals both to the buyers and to the sellers, governing their choices of how much to buy and sell, and eventually assigning a kind of value to the good. The free movement of the price can bring about the equilibrium, when buyers want to buy exactly that quantity that sellers want to sell. Equilibrium is one of the most important concepts in economics, and going to surface throughout both microeconomics but also macroeconomics.

Any change in the demand of buyers or the supply of sellers changes will have an effect on the equilibrium. Another crucial ability in understanding economic events around us is to understand comparative statics, in this case how the demand-supply analysis works dynamically. A change in one of the influencing factors will set off an adjusting mechanism that will lead to a different equilibrium than we started out with.

All the above analysis has to be done in an idealized, simplified model of reality. A model emphasizes the most important aspects of reality, and assumes away other not so important aspects. A good model does not have to be realistic, but has to be able to predict the reaction of the original system to the changed parameters accurately.

Learning outcomes

- *Students should become familiar with demand-supply analysis*
- *Students become able to differentiate between factors influencing the consumers and factors influencing the producers*
- *Students should gain understanding into what moves market prices and quantities*
- *Similarly students will become able to identify what changes could have caused an observed movement in prices and quantities*
- *Students realize why the market allocation is called efficient and other allocations mostly are not*

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Definitions

Ceteris paribus: latin phrase for “all else remaining constant.” When we want to explore the effects of a change in a variable on another variable, we keep all other factors that might possibly affect the outcome constant, so that the change in the result is directly attributable to the change in the one variable we changed in the beginning.

Demand function: it is the relationship between the price of the commodity and the quantity that people would want to buy of it.

Supply function: it is the relationship between the price of the commodity and the quantity of it that companies/producers would produce and bring to market.

Equilibrium: the state of the market when the quantity supplied is equal to the quantity demanded. This happens at a specific price that we call equilibrium price.

Shortage: a state of the market, when due to a price that is too low the quantity demanded is higher than the quantity supplied.

True or False questions

A11. If more and more consumers come to a certain market, the demand curve shifts to the right.
A12. If the government orders that a certain commodity has to be sold at a p = 0 price, then every consumer will be able to have it.
A13. When supply is fixed, demand alone determines the price.
A14. The cause of shortage is that firms are not willing to produce enough of a good.
A15. Perfect competition is called Pareto-efficient because nobody could be made better off with a different allocation.
A16. If the demand for a certain product increases, you will have to pay a higher price to buy it.
A17. A Pareto-efficient allocation is not necessarily also socially optimal and desirable.
A18. At the end of the summer season summer clothes are cheaper because the supply of them has increased.

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Simple choice questions

B11. Which of the following can NOT mean an increase in the demand for a certain good?
a) the consumers' income increases.
b) the price of a complementary good goes down.
c) the number of consumers on the market increases.
d) the producers are producing more of the good.

B12. Suppose that in a market, the demand for a good increases. After the increase, in the new equilibrium
a) both the price and the quantity will be higher than originally.
b) both the price and the quantity will be lower than originally.
c) the price will be higher, but the quantity will be lower than originally.
d) the price will be lower, but the quantity will be higher than originally.

B13. If due to an economic slowdown some firms go out of business in a market, that would
a) shift the demand function to the right.
b) make the demand function steeper.
c) shift the supply function to the left.
d) not affect either the supply or the demand function, only the price of the product.

B14. If the government fixes a price for a given product that is above the equilibrium price,
a) firms will be happy because they can sell the same quantity as before, but at a higher price.
b) the firms will find that they are not able to sell all they want at the higher price.
c) the demand curve shift to the right so that this fixed price becomes the equilibrium.
d) there will be a shortage of the product.

B15. Economists like perfect competition, because
a) everybody who needs the product can get it.
b) no other market form could generate more profit to the producers.
c) it is Pareto-efficient.
d) it is realistic.

B16. Which of the following will happen on a market where there is excess supply?
a) The price of the good will decrease.
b) The demand function will shift to the right.
c) The supply function will shift to the left.
d) The quantity of the good will decrease.

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B17. How do companies realize that there is an excess demand for their product?

a) They cannot sell all the goods they produce.
b) The supply function shifts to the right.
c) The product sells out quickly and the sellers cannot satisfy all consumer demand.
d) Some companies go out of business and the number of competitors decreases.

B18. The supply function generally is a ...

a) positive functional relationship between the price of the good and the quantity consumers would want to buy at different prices.
b) positive functional relationship between the number of competitors on a market and the quantity of the product they are willing to produce.
c) negative functional relationship between the price of the good and the quantity that producers are willing to produce at different prices.
d) positive functional relationship between the price of the good and the quantity that producers are willing to produce at different prices.

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Solutions

A11.	True	B11.	D
A12.	False	B12.	A
A13.	True	B13.	C
A14.	False	B14.	B
A15.	False	B15.	C
A16.	True	B16.	A
A17.	True	B17.	C
A18.	False	B18.	D

Explanation to the solutions of true or false questions

A11. If more and more consumers come to a certain market, the demand curve shifts to the right.

TRUE, because more consumers on a market means that even if the price does not change now a higher quantity will be demanded, and that is what a right shift in demand is. Quantity demanded increases for every price.

A12. If the government orders that a certain commodity has to be sold at a $p = 0$ price, then every consumer will be able to have it.

FALSE, at zero price the result would be a huge excess demand. Could everybody get a Ferrari simply if its price would be reduced to zero? Perhaps everybody would like to have one (not even that, because now some people buy it as a symbol of status, because others can not have it. If everybody could have it, they would not want to), but who will produce it, if the price is zero? The actual quantity traded depends on demand and supply.

A13. When supply is fixed, demand alone determines the price.

TRUE: fixed supply means a given available quantity, whatever the price is. In this case, price is only to ration the available quantity to those willing to pay the most (who need the product the most?). It is like an auction: the price will increase until only that many is demanded as is supplied.

A14. The cause of shortage is that firms are not willing to produce enough of a good.

FALSE. Firms would always be willing to produce more, if the price is good. Let the price rise, and you will see firms racing to supply the market. The reason for shortage is the too low price. As the price increases, firms are encouraged to produce more, and consumers are discouraged from buying, so the difference between demand and supply (the shortage) diminishes.

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A15. Perfect competition is called Pareto-efficient because nobody could be made better off with a different allocation.

FALSE. Alternative allocations might profit some, but at the same time hurt others. Any such reallocation is not a Pareto improvement. It is just that nobody could get better off without someone getting worse off: and this is the definition of Pareto efficiency.

A16. If the demand for a certain product increases, you will have to pay a higher price to buy it.

TRUE. Increased demand means a right shift in the demand curve. This would bring the market into a temporary excess demand, and the result would be a higher price. At the same time, the quantity traded would become more.

A17. A Pareto-efficient allocation is not necessarily also socially optimal and desirable.

TRUE. Pareto-efficiency only means that nobody can become better off without at least one person becoming worse off. If all possible gains of trade accumulate at one person (for example a king or an oligarch), it is efficient, but not very equitable. We would rather like to see gains dispersed more evenly to everybody.

A18. At the end of the summer season summer clothes are cheaper because the supply of them has increased.

FALSE. Although an increased supply would indeed result in a lower price, this situation is rather about shops wanting to sell out their remaining fixed stocks of summer clothes at the end of season when the demand is smaller for them. At the end of summer season and the beginning of the winter season the supply of summer clothes also falls back.

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Explanation to the solution of single choice questions

B11. Which of the following can NOT mean an increase in the demand for a certain good?

Demand for a good is about a relationship between prices and quantities that consumers want to buy at given prices. Anything that changes this relationship will shift the demand.

a) the consumers' income increases.

At higher incomes consumers will likely want to buy more even if the price is the same. So the relationship changes, demand shifts.

b) the price of a complementary good goes down.

Complementary good is a good that you use together with the good in question. If the price of that decreases, you will likely want to buy more of it, but then you need more of this specific good that the question is about too, even if its price does not change.

c) the number of consumers on the market increases.

More consumers mean more people wanting to buy at any price than before.

d) the producers are producing more of the good.

Producers have nothing to do with the demand curve. Consumers probably will not even be aware that producers are producing more. But even if they were, seeing more cans of Coke on the selves will not make me want to buy more. Unless this causes its price to go down, but even then I will only want to buy more because the price is lower, so only quantity demanded changes, not the demand function.

B12. Suppose that in a market, the demand for a good increases. After the increase, in the new equilibrium

As a help you can draw yourself a normal upward-sloping supply and a downward-sloping demand curve. Their intersection is the equilibrium. Now shift the demand curve to the right, since that represents an increase in the demand for a good.

a) both the price and the quantity will be higher than originally.

The new equilibrium is to the north-east of the original, so it means a higher value on both the price and the quantity axis.

b) both the price and the quantity will be lower than originally.

This would be the case with a decrease, or a left shift in demand.

c) the price will be higher, but the quantity will be lower than originally.

This is what would happen if the supply decreased, so the supply curve would have shifted to the left.

d) the price will be lower, but the quantity will be higher than originally.

An increase in supply would have this result.

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B13. If due to an economic slowdown some firms go out of business in a market that would

You have to identify which function is affected, and in which direction. Supply is representing firms or producers, demand represents buyers or consumers. Increase shifts to the right, decrease shifts to the left.

a) shift the demand function to the right.

For this to be true something good or advantageous should happen to the consumers.

b) make the demand function steeper.

The steepness is in connection to how sensitively the consumers react to price changes

c) shift the supply function to the left.

The producers are affected, so the supply function should shift, and producers are affected badly, there is now less of them, so the shift is to the left. At any prices now less is being produced, than before.

d) not affect either the supply or the demand function, only the price of the product.

This is downright silly: if none of the functions move, neither will the equilibrium.

B14. If the government fixes a price for a given product that is above the equilibrium price,

If the market is left alone, the equilibrium price and quantity will evolve. The government can set a different price than that, and override the market mechanism, so that prices are not allowed to move, in this case decrease freely.

a) firms will be happy because they can sell the same quantity as before, but at a higher price.

Asking a higher price is not the same as getting a higher price. The higher price will discourage some buyers from buying, so they will not be able to sell the same quantity

b) the firms will find that they are not able to sell all they want at the higher price.

At higher prices firms are willing to produce and bring to market a higher quantity, but buyers will be willing to buy less. The difference is called excess supply.

c) the demand curve shift to the right so that this fixed price becomes the equilibrium.

Fixing a price will have no effect on how much people are willing to buy at different prices, so the demand curve will not be affected.

d) there will be a shortage of the product.

Shortage, or excess demand is the opposite of excess supply. Shortage is when consumers would want to buy more at the going price than is offered for sale, and that would be the effect of too low prices.

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B15. Economists like perfect competition, because

Economists say that perfect competition is better in the social sense of the word than any alternative ways of allocating resources.

a) everybody who needs the product can get it.

It is difficult to say what constitutes "need". If we say people need a quantity they would choose to have if the good were free, than perfect competition will produce less than that. Some people will not be able to have the product even though they might be willing to pay sum price for it which is higher than zero, but lower than the equilibrium price.

b) no other market form could generate more profit to the producers.

Firms try to get in a monopoly position exactly because it provides them a higher profit than being one of many perfectly competing firms.

c) it is Pareto-efficient.

It means nobody could get better off without somebody getting worse off. Producers could not get better off, because everybody willing to can sell at the current price, buyers can not get better off because everyone willing to is able to buy at this price. The sum of consumer and producer surplus is maximized.

d) it is realistic.

Perfect competition is from the assumptions out not realistic. It would require infinite number of sellers, perfect and costless information, none of which is realistic, and economists are well aware of this. It is just a good approximation, a good benchmark, against which to measure everything else.

B16. Which of the following will happen on a market where there is excess supply?

Excess supply is a state of disequilibrium in the market when at the going price the quantity supplied exceeds quantity demanded.

a) The price of the good will decrease.

Excess supply is actually the result of a price higher than the equilibrium or market-clearing price. Without any intervention, the market mechanism results in the price naturally sinking to its equilibrium level.

b) The demand function will shift to the right.

If the demand function shifts to the right, we can get back to equilibrium. But just because sellers now want to sell more than the consumers want to buy, why would it induce the consumers to be willing to buy more at the same price as before?

c) The supply function will shift to the left.

This would be another way to get back to equilibrium. But what would induce the producers to sell less at the going price than before? They are optimizing, and based on the price they decide the quantity. If price does not change, quantity also does not change. At best some companies will go out of business, and the market supply decreases. But do we think it happens quicker than the price could adjust downward?

d) The quantity of the good will decrease.

At every price firms are offering the profit maximizing quantity, which is now just happens to be more than the quantity that consumers want to buy.

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B17. How do companies realize that there is an excess demand for their product?

Excess demand is a state of disequilibrium in the market when at the going price the quantity demanded exceeds quantity supplied. Problem is, that companies do not have the kind of demand and supply functions we had in the exercises on their hands, so they have to find out somehow, when there is excess demand.

a) They cannot sell all the goods they produce.

This would be an indication of excess supply to them.

b) The supply function shifts to the right.

When this happens it means that firms are producing a higher quantity at every level of the price than before. Just from seeing that more people want to by the good, than the quantity available the firms will not produce more. It is like seeing how many people want a Ferrari, the company would start producing more at the current price.

c) The product sells out quickly and the sellers cannot satisfy all consumer demand.

The reason for the excess demand is low price. When the price is low and people find out about it they will go to the company to buy the product. If enough many people go there, a queue will be formed, and the ones getting there earlier will be able to buy the product, but soon it will sell out, and some dissatisfied consumers will stay there willing to pay the price but not finding any more of the product.

d) Some companies go out of business and the number of competitors decreases.

Excess demand is generally an incentive for firms on the market to produce more (even if at a higher price), and for firms outside of the market to enter this market if at all possible. So when there is excess demand we can rather expect to see the number of competitors increase.

B18. The supply function generally is a ...

The supply function is a compact way to describe producers' behavior, and is of a form Q = f(P).

a) positive functional relationship between the price of the good and the quantity consumers would want to buy at different prices.

Since supply is about the producers, we can rule this one out right away.

b) positive functional relationship between the number of competitors on a market and the quantity of the product they are willing to produce.

This is already in connection with the producers, but the variables are not right. Although the relationship between these variables is correct (more producers are producing more), it is not what the supply function describes.

c) negative functional relationship between the price of the good and the quantity that producers are willing to produce at different prices.

Now we are talking about producers, the variables are the right ones, only the relationship is not correct this time.

d) positive functional relationship between the price of the good and the quantity that producers are willing to produce at different prices.

Here we have everything right.

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Detailed definitions with page references

Ceteris paribus: Latin phrase for “all else remaining constant.” When we want to explore the effects of a change in a variable on another variable, we keep all other factors that might possibly affect the outcome constant, so that the change in the result is directly attributable to the change in the one variable we changed in the beginning.

When you change more things at the same time, you will not be able to tell which caused the change in the outcome. If you fill up your car with better quality gas and drive slower, the consumption will drop: but which caused the drop more?

Demand function: it is the relationship between the price of the commodity and the quantity that people would want to buy of it.

It is generally an inverse relationship: if the price of a commodity goes up – ceteris paribus – then people will want to buy less of the commodity, because they will find substitute products (ch 1.3 pp.3-5)

Supply function: it is the relationship between the price of the commodity and the quantity of it that companies/producers would produce and bring to market.

It is generally a direct relationship: as the price of a good increases, producers are willing to produce more of it (ch 1.4 pp.5-7)

Equilibrium: the state of the market when the quantity supplied is equal to the quantity demanded. This happens at a specific price that we call equilibrium price.

At this price neither the sellers nor the buyers have an incentive to change their behavior: everybody willing to buy at this price will be able to, and everybody willing to sell at this price will be able to. If the price is any different from the equilibrium price, the market is in disequilibrium (ch. 1.5 p.7)

Shortage: a state of the market, when due to a price that is too low the quantity demanded is higher than the quantity supplied.

Also called excess demand, because it is a case when demand exceeds, is bigger than supply. If the prices can freely adjust, they will increase, and the higher they go the more producers will be encouraged to sell and the less buyers will be encouraged to buy, until the shortage is finally eliminated (p.8)

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Topic 2: Consumers' Choice 1: Budget and Preferences (Chapters 2-4)

Topic overview

Topic 2 and 3 look behind the demand curve and explore what exactly is the reason why consumers tend to buy less of a good if its price goes up. The basic explanation of the consumers choice is that it comes together from two parts: one is what the consumer can have, and the other is what the consumer would like to have.
The consumer's ability to buy goods and services depends on three things, each of which is external to the consumer, namely on his/her income (which can be influenced by the consumer, but we will assume it is given), the price of the good we are concentrating on, and the price of another, or all other goods. Our basic model will allow only two goods the consumer can choose from. With the help of these three parameters we can determine the budget line, the Pareto-efficient ways the consumer can spend his/her income on the two goods. Using the comparative static it is important to understand how any change in one or more of the factors mentioned is affecting the budget line, and thus the consumer's ability to purchase the goods.
The consumer's willingness to consume the goods on the contrary depends on factors internal to the consumer: his/her tastes. This is an indication of what value the consumer attaches to different quantities of the goods relative to each other. It is not about the value of apple to orange, but rather about the value of the fifth apple relative to the second orange. With the preference ordering, expressed graphically with indifference curves and algebraically with the utility function the consumer will be able to say clearly which combination of the two goods he/she considers to be the best.
These two building blocks are going to be needed in the following topic to determine the optimal choice of the consumer.

Learning outcomes

- *Students will understand the difference between what the consumer "can" buy, and what the consumer "wants" to buy*
- *Students will realize that consumer preferences are independent of income and prices, and that ability to buy is independent of tastes*
- *Students will become proficient with how to describe tastes of the consumer and his/her ability to buy*
- *Students will be able to identify how certain changes affect the set of just available consumption bundles*
- *Students will be able to use preferences to compare consumption bundles*

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Definitions

(Ch 2)
Consumption bundle: is a mix of goods containing certain quantities of different commodities.
Budget line: is the set of those commodity bundles that cost exactly as much as the available income of the consumer.

Opportunity cost: the value of the most valuable alternative given up. It shows how much consumption of a certain good you have to give up to be able to consume one more of another good.

Real income: is the purchasing power of the income showing how much goods a consumer can buy from his/her current income at the current prices.

(Ch 3)
Preference: is the taste of a consumer enabling the consumer to decide for any two consumption bundles whether he/she prefers the one or the other, or whether they are equally desirable.

Indifference curve: a set of commodity bundles the consumption of any of which would mean the same satisfaction to the consumer.

Marginal Rate of Substitution: shows at what rate a consumer is just willing to substitute away the two commodities from an initial consumption bundle without a change in the utility level.

(Ch 4)
Marginal utility: shows how the utility attained from consumption changes as the quantity consumed changes.

Gossen's first law (law of diminishing marginal utility): if a consumer keeps on increasing the consumption of a commodity – ceteris paribus – the resulting increase in utility attained will be smaller and smaller.

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True or False questions

A21. The rate at which a consumer is willing to exchange Commodities 1 and 2 depends on the consumer's income.
A22. The marginal rate of substitution can be calculated as p1/p2.
A23. The alternative cost of Commodities 1 and 2 depends on the consumer's tastes for the two commodities.
A24. Marginal rate of substitution depends on the income of the consumer.
A25. If the budget line becomes steeper, this means to the consumer, that one of the commodities becomes more expensive relative to the other.
A26. When a consumer increases his/her consumption of a product, the additional utility gained from consumption decreases.
A27. In the consumers' choice model, if the consumer chooses a bundle that is cheaper than his/her income, then this can not be an optimal choice.
A28. Commodities for which the consumer has a Cobb-Douglas utility function are neither substitutes, nor complements.

Single choice questions

B21. In the consumers' choice model, if both commodity's price increases by the same value (measured in Forint), then the budget line
a) shifts farther from the origin.
b) is going to be parallel to the budget line before the change.
c) is getting steeper.
d) might become steeper of flatter.

B22. In the consumers' choice model, if the consumer's income increases, then the budget line
a) paralelly shifts farther from the origin.
b) is going to be flatter than the budget line before the change.
c) is getting steeper.
d) might become steeper of flatter.

B23. In the consumers' choice model we see the consumer's budget line shift to the right (away from the origin). We can be sure that…
a) the consumer's income decreased.
b) the price of one or both commodities decreased.
c) the consumer will buy more of both goods.
d) the consumer will attain higher utility.

B24. The alternative cost of getting one unit of Commodity 1 is 4 units of Commodity 2. This means, that
a) $MU_1 = 4$
b) $MRS = 4$
c) $U = x_1 + 4 \cdot x_2$
d) $p_1/p_2 = 4$.

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B25. The consumer is willing to give up 4 units of Commodity 2 for one more unit of Commodity 1. This means, that
a) $MU_1 = 4$
b) $MRS = 4$
c) $U = x_1 + 4 \cdot x_2$
d) $p_1/p_2 = 4$.

B26. The indifference curves are convex because
a) the consumer prefers bundles of average composition to bundles of extreme composition.
b) the consumer likes both goods that he/she purchases.
c) one of the goods has a higher price than the other.
d) if they were not we could not determine optimal choice.

B27. The reason why a consumer's well behaved indifference curves are convex is
a) that the consumer prefers balanced consumption to extreme bundles.
b) because the consumer always buys more of one good and less of the other.
c) because both of the goods are useful for the consumer.
d) because the goods are perfect substitutes.

B28. Which of the following is NOT a characteristic of a well-behaved indifference curve?
a) negative slope
b) linearity
c) curves further from the origin represent higher utility
d) convexity

B29. Suppose the consumer notices that the price of one of the goods he/she is buying decreases. Which of the following statements is not true?
a) the consumer can buy more of both goods.
b) the consumer will buy more of both goods.
c) the consumer will buy more of at least one of the goods.
d) the consumer will be able to reach higher level of utility.

B210. You can choose from 3 options: A, B and C. Choosing A, your opportunity cost will be…
a) the value of A.
b) the value of B and C.
c) the higher of the values of B or C.
d) 0 since you do not have to pay anything to get A.

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Solutions

A21. False
A22. False
A23. False
A24. False
A25. True
A26. True
A27. True
A28. False

B21. D
B22. A
B23. D
B24. D
B25. B
B26. A
B27. A
B28. B
B29. D
B210. C

Explanation to True of false questions

A21. The rate at which a consumer is willing to exchange Commodities 1 and 2 depends on the consumer's income.

FALSE. The rate in question is the marginal rate of substitution, and it is derivable from the consumers preferences.

A22. The marginal rate of substitution can be calculated as p1/p2.

FALSE. In case of the optimal choice we will find this to be true, but this is not how MRS is calculated. MRS is the ratio of the two commodities' marginal utilities, and in the optimum this has to be equal to the price ratio.

A23. The alternative cost of Commodities 1 and 2 depends on the consumer's tastes for the two commodities.

FALSE. Alternative cost shows how much of one of the commodities you have to give up to get an additional unit of the other. How much apples you have to take out of the basket in order to free up enough money to put in a bottle of coke is the same whether you like coke or not.

A24. Marginal rate of substitution depends on the income of the consumer.

FALSE. Same as B1.

A25. If the budget line becomes steeper, this means to the consumer, that one of the commodities becomes more expensive relative to the other.

TRUE. The slope of the budget line is the price ration, or opportunity cost of the commodities. To be more precise in this case commodity 1 becomes more expensive, and commodity 2 cheaper relative to the other. The question would be

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true even if it said "If the budget line becomes flatter…". The difference would be that in this case commodity 2 would become more expensive and commodity 1 cheaper.

A26. When a consumer increases his/her consumption of a product, the additional utility gained from consumption decreases.

TRUE. This is what Gossen's first law says. Even if this does not happen at the 2nd, 3rd or 4th unit of consumption, MU will eventually decrease.

A27. In the consumers' choice model, if the consumer chooses a bundle that is cheaper than his/her income, then this can not be an optimal choice.

TRUE. Such a choice would mean choosing from the bundles below the budget line. Since some money would be left, the consumer could buy more of any or both of the commodities without having to consume less of any of them. Thus, utility could definitely be increased from the current income at the current prices, consequently the original choice could not have been optimal.

A28. Commodities for which the consumer has a Cobb-Douglas utility function are neither substitutes, nor complements.

FALSE. In fact such products are both substitutes and complements. They are complements, because the consumer will want to buy of both commodities, otherwise utility is zero. And they are substitutes, since buying less of one of them the consumer can increase utility by buying more of the other, this is what the negative slope of the indifference curve and the marginal rate of substitution also tells us.

Explanation to single choice questions

B21. In the consumers' choice model, if both commodity's price increases by the same value (measured in Forint), then the budget line

The budget line can be written up as $x_1 = m/p_1 - p_2/p_1 \cdot x_2$ or $x_2 = m/p_2 - p_1/p_2 \cdot x_1$ where the first part is the intercept and the multiplier of the x is the slope.

a) shifts farther from the origin.

if the prices increase, the intercepts m/p will became smaller, so the shift is rather towards the origin.

b) is going to be parallel to the budget line before the change.

this is possible, but only if the two prices are the same initially. We have no information for that, so we cannot say this for sure.

c) is getting steeper.

it would mean that the slope becomes more negative. The alternative cost of commodity one should increase. This would be the case if we knew that the original price of commodity one is smaller than the price of commodity two.

d) might become steeper of flatter.

since we don't know the relationship between the prices originally, all we are able to say

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is that the relationship (the slope) will change, but we cannot tell in which direction.

B22. In the consumers' choice model, if the consumer's income increases, then the budget line
The budget line can be written up as $x_1 = m/p_1 - p_2/p_1 \cdot x_2$ or $x_2 = m/p_2 - p_1/p_2 \cdot x_1$ where the first part is the intercept and the multiplier of the x is the slope.

a) parallely shifts farther from the origin.
The important word here is parallely, meaning the slope does not change. As we see, the income has nothing to do with the slope.

b) is going to be flatter than the budget line before the change.
slope is only changing if one (or both) of the prices change.

c) is getting steeper.
slope is only changing if one (or both) of the prices change.

d) might become steeper of flatter.
slope is only changing if one (or both) of the prices change.

B23. In the consumers' choice model we see the consumer's budget line shift to the right (away from the origin). We can be sure that…
We get information about the direction of the shift, but not about whether it is a parallel shift or not.

a) the consumer's income decreased.
the direction is not right. Income decrease shifts the budget line parallel towards the origin.

b) the price of one or both commodities decreased.
here the direction is right, price decrease would shift the budget line away from the origin. But since it is not the only way (income increase could do that too), we can not say this for sure.

c) the consumer will buy more of both goods.
how the budget line changes only shows whether the consumer could buy more or less of the goods, not that he/she will.

d) the consumer will attain higher utility.
the right shift in the budget line means, that for any bundle on the original (pre-shift) budget line the consumer could buy more of any of the commodities without having to buy less of the other, so utility will necessarily increase, if at least one of the goods is useful to the consumer.

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B24. The alternative cost of getting one unit of Commodity 1 is 4 units of Commodity 2. This means, that

The alternative cost is the slope of the budget line.

a) $MU_1 = 4$

Marginal utility is in connection with the preferences.

b) $MRS = 4$

Marginal rate of substitution is in connection with the preferences, it is the slope of an indifference curve.

c) $U = x_1 + 4 \cdot x_2$

Utility function also has nothing to do with the budget line.

d) $p_1/p_2 = 4$.

The slope of the budget line is the price ratio.

B25. The consumer is willing to give up 4 units of Commodity 2 for one more unit of Commodity 1. This means, that

This is the slope of the indifference curve.

a) $MU_1 = 4$

this is in connection with the preferences, but it tells us nothing about how useful commodity 2 is. Intuitively to be willing to substitute them we should know about the marginal utility of both.

b) $MRS = 4$

marginal rate of substitution is the ratio of the marginal utilities of the two commodities and is the slope of the indifference curve.

c) $U = x_1 + 4 \cdot x_2$

this is a utility function. From this we could calculate $MRS = MU_1/MU_2 = ¼$. In this case the consumer is willing to give up ¼ unit of commodity 2 for one more unit of commodity 1.

d) $p_1/p_2 = 4$.

this is the slope of the budget line, it has nothing to do with the rate at which the consumer is willing to substitute. Especially because prices are the same for everyone, so this would mean that everybody has a same willingness to substitutes, which is obviously not the case.

B26. The indifference curves are convex because

Convexity means that as you move down along the indifference curve, its slope is smaller and smaller, so the consumers are willing to give up less and less of commodity 2 to get an additional commodity 1.

a) the consumer prefers bundles of average composition to bundles of extreme composition.

all average compositions would be on a straight line connecting two extreme bundles. If any of these has to be preferred to the extremes, all have to be on a higher indifference curve, but the two extremes on the same. The only way is if the indifference

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curve containing the extremes go below the connecting straight line, which means it has to be convex.

b) the consumer likes both goods that he/she purchases.
liking both goods mean positive marginal utility for both. But if the positive utilities are constant, the marginal rate of substitution is also constant, so willingness to substitute is constant, and the indifference curves will become straight lines, which are not convex.

c) one of the goods has a higher price than the other.
prices have nothing to do with preferences and indifference curves.

d) if they were not we could not determine optimal choice.
We can determine optimal choice with linear, kinked, even concave indifference curves, not only for well-behaved convex preferences.

B27. The reason why a consumer's well behaved indifference curves are convex is
See previous one.

a) that the consumer prefers balanced consumption to extreme bundles.

b) because the consumer always buys more of one good and less of the other.
This can also happen if the goods are perfect substitutes and the indifference curve is linear (the consumer will likely buy only of one of them) or with perfect complements with L-shaped indifference curves (use them in fixed proportions, like always in a 3 to 1 ratio)

c) because both of the goods are useful for the consumer.

d) because the goods are perfect substitutes.
for perfect substitutes the marginal rate of substitution is constant, and the indifference curves are linear.

B28. Which of the following is NOT a characteristic of a well-behaved indifference curve?
Well-behaved preferences are for example the ones that can be described by a Cobb-Douglas type utility function. Try to remember how indifference curves usually looked like

a) negative slope
They did have negative slope. You would get positive slope if one of the goods were actually a "bad".

b) linearity
They were not linear. Linearity means constant slope, or marginal rate of substitution. Average consumption bundles would be just as good as extreme ones. This is not true in the well-behaving case

c) curves further from the origin represent higher utility
This is true for well-behaved preferences and most other preferences too.

d) convexity
Convexity means decreasing marginal rate of substitution, that is consistent with a well-behaved indifference curve. Bundles of average composition will now be preferred to bundles of extreme composition.

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B29. Suppose the consumer notices that the price of one of the goods he/she is buying decreases. Which of the following statements is not true?

We don't know anything about the preferences of the consumer. What we know is only that as a result of the price change, one of the intercepts of the budget line will shift further from the origin.

a) the consumer can buy more of both goods.

Since the price of the other good has not changed, the consumer could not buy more of that: the other intercept does not change.

b) the consumer will buy more of both goods.

What happens to the budget line only tells us about what the consumer could buy, not what he/she will buy.

c) the consumer will buy less of one of the goods.

Though it is possible that the consumer rearranges the consumption bundle so that he/she buys so much more of the good becoming cheaper that he/she eventually has less money left for the other, but it is definitely not sure. For example with Cobb-Douglas preferences this cannot happen.

d) the consumer will be able to reach higher level of utility.

With the tilting of the budget line the consumer can reach now such bundles that were not feasible before. The choice set grew, the consumer must definitely become better off.

B210. You can choose from 3 options: A, B and C. Choosing A, your opportunity cost will be…

Choosing something always means giving up something else. You will weigh the different options, you will weigh what you gain against what you lose. What you have to give up is the opportunity cost.

a) the value of A.

This is what you gain.

b) the value of B and C.

If you can only pick one of the options you could not have chosen B and C, only one of them. So B and C together is not really an option that you give up.

c) the higher of the values of B or C.

Suppose you can only pick one, and leave the other two behind. Suppose also that B is not really desirable to you, but C is. You will not really care about not being taking B, only about not taking C (but you are consoled by the fact that you have A, which must be even more desirable than C, otherwise you would have chosen C).

d) 0 since you do not have to pay anything to get A.

It is true you don't have to pay anything, but opportunity cost is not necessarily money cost. If you have to give up something valuable for your choice, there is opportunity cost.

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Detailed definitions with page references

(Ch 2)

Consumption bundle: is a mix of goods containing certain quantities of different commodities.

> *You as a consumer can always decide how much of which goods you put in your basket. If there are two goods, a possible consumption bundle is buying 2 of the one and 3 of the other, another would be buying 4 of the one and only 1 of the other, and so on. These are consumption bundles (p.21)*

Budget line: is the set of those commodity bundles that cost exactly as much as the available income of the consumer.

> *All points of the budget line represent a bundle that the consumer is able to buy from his/her income in such a way that all the income will be spent. It is the upper boundary of the budget set, the most efficient ways to spend the income at the going prices. Given the income and the prices of the goods, starting from any bundle on the budget line the consumer can only have more of one of the commodities if he/she gives up some of the other (p.22-23)*

Opportunity cost: the value of the most valuable alternative given up. It shows how much consumption of a certain good you have to give up to be able to consume one more of another good.

> *Opportunity cost is the slope of the budget constraint, and is equal to the price ratio. Another interpretation is that it show us at what rate the consumer is able to substitute the two commodities to each other. If a consumer wants to buy more of a certain good, he/she has to free up money, and that is only possible by buying less of another good. In general when you use your money to buy something useful for yourself it is not so much the money itself you spent that you feel a little sad about, but all the other useful things you could have bought with that money (p.23)*

Real income: is the purchasing power of the income showing how much goods a consumer can buy from his/her current income at the current prices.

> *This means that changes in either the income or the prices change the real income. If income increases, the consumer can buy more of either goods, real income definitely increased. If only the price of one of the commodities change, for example rises, than the consumer's real income in that commodity falls (could buy less of it), but real income in the other commodity remains the same. If income and prices rise to the same degree, real income won't change (p.31)*

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(Ch 3)

Preference: is the taste of a consumer enabling the consumer to decide for any two consumption bundles whether he/she prefers the one or the other, or whether they are equally desirable.

> *Since people have different tastes, people prefer different goods and different bundles. Suppose you have two bundles: an ice cream with 2 cones of lemon and 1 cone of vanilla and another with 2 cones of chocolate and 1 cone of strawberry. Someone preferring fruity and sour tastes would take the first, someone preferring sweet would take the second. Notice that the price of the two would be the same (p.34-36)*

Indifference curve: a set of commodity bundles the consumption of any of which would mean the same satisfaction to the consumer.

> *A consumer is indifferent between any two commodity bundles on a given indifference curve, he/she does not prefer any of them above any other. Since they are equally useful to him/her, he/she could only choose from them based on how much the bundles cost (p.36)*

Marginal Rate of Substitution: shows at what rate a consumer is just willing to substitute away the two commodities from an initial consumption bundle without a change in the utility level.

> *It is the slope of the indifference curve at a given point. Indifference curves show that for any bundle the consumer can find many others that have the same utility. The consumer is willing to substitute these for each other. He/she is willing to take out some of one of the commodities if he/she can get more of the other (p.48)*

(Ch 4)

Marginal utility: shows how the utility attained from consumption changes as the quantity consumed changes.

> *Mathematically it is the slope of the utility function. When a consumer consumes more of a product utility gained from consumption changes. If the consumer likes that product, consuming it will increase utility so marginal utility, the change in utility is positive. If the consumer dislikes the product, marginal utility will be negative (p.65)*

Gossen's first law (law of diminishing marginal utility): if a consumer keeps on increasing the consumption of a commodity – ceteris paribus – the resulting increase in utility attained will be smaller and smaller.

> *Even if the consumer likes the product, and marginal utility is positive, the consumer tends to satiate sooner or later with consumption. Coming closer and closer to satiation additional units of the commodity consumed always increase utility to a smaller and smaller degree. This is the reason why we would not consume infinitely (at a given point in time) even if consumption is free.*

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Topic 3: Consumers' Choice 2: Optimal Choice and Demand Analysis (Chapters 5-6; 15)

Topic overview

This topic puts together the two important concepts of the budget line and the utility function or preferences to determine optimal choice. Just like in the case of the market where there was a conflict of interest between the two sides (buyers want lower prices, sellers want higher prices), here too we have a conflict of interest (I want to spend less on the goods, but want to consume more of them). Here, however, the conflict of interest is not between different players (buyers and sellers), but within one individual. Finding the solution in such cases is called optimizing. We need optimal choice when neither too much, nor too little of something is good, and we have to find the middle way. The choice is a constrained maximization, as we try to figure out how to get maximum utility out of a given income and at given prices. Using the criterion for optimal choice we get to one bundle, or combination of goods that is optimal for the consumer.
Comparative static analysis will again tell us how the quantity of goods that a consumer wants to and willing to buy changes as influencing factors change, or looking at the reverse causality, what could make a consumer willing to buy more goods.
From functional relations between an influencing factor and the quantity sought to buy we get to the demand functions. We can analyze demand in different ways, one of these is elasticity, which tells us how strongly, or sensitively the consumer reacts to a change in one single factor influencing his/her purchasing decision. Based on this sensitivity of choice we can categorize the goods into categories like substitutes and complements, luxury goods, basic necessities or inferior goods. Knowing the relationship between one good and another can give hints to a marketing professional on how to better sell the good in question to a consumer.

Learning outcomes

- *Students familiarize themselves with the notion of "optimizing": hot to put together ends (preferences) and means (budget constraint)*
- *Students will be able to identify what factors influence the consumer's best choice, and in what way*
- *Students will realize how the demand is the combined result of what the consumers want to buy and what they can buy*
- *Students understand the notion of "aggregating" when the behavior of groups of actors is analyzed*
- *Students will understand elasticity as the economist's way to say how sensitively something reacts to a change in the determining factors*

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Definitions

(Ch 5)
Rationality: a basic assumption about human behavior. We assume that people in their choices aim at maximizing result for a given effort, or minimizing effort for a given result.

Optimal choice: the consumer spends his/her income optimally, if he/she chooses that bundle from the budget line that has the highest utility.

(Ch 6)
Normal good: if quantity demanded increases as a result of a ceteris paribus increase in the consumer's income, it is a normal good.

Inferior good: is a good of which consumers buy less if their income becomes ceteris paribus higher.
Ordinary good: if an increase in the price of a good induces the consumer to buy less of it, it is an ordinary good.

Reservation price: is the highest price that a consumer is willing to pay for a given quantity of the good.

Substitute products (or simply: substitutes): A and B are substitute products, when an increase in the price of A results in a consumer buying more of B.

Complementary products (or simply: complements): A and B are complements when as a result of an increase in the price of A the consumer would buy less of B.

(Ch15)
Price elasticity of demand: It shows that a one percent change in the price of a product would result in a what percentage change in its quantity demanded.

Price-elastic demand: demand is price-elastic if one percent change in the price changes the quantity demanded by more than one percent.

Price-inelastic demand: demand is price-inelastic if one percent change in the price changes the quantity demanded by less than one percent.

Consumers' surplus: it shows how much higher a given quantity of goods purchased is valued by the consumers than what they had to pay to obtain that quantity.

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True of False questions

A31. If demand for a product is price-elastic, then revenue can be increased by lowering the price.
A32. A consumer is willing to purchase a product as long as its marginal utility is positive.
A33. When a product has lots of substitutes, its demand is price-elastic.
A34. The consumer is only willing to buy a product if his/her reservation price is higher than the market price of the product.
A35. If the price of commodity 1 is higher than the price of commodity 2, than the consumer will definitely buy more of commodity 1.
A36. Marginal rate of substitution is always equal to the price ratio.
A37. Two consumers faced with the same prices and having the same income will necessarily choose the same consumption basket.

Single choice questions

B31. If the consumer's utility function is $U = x_1^{0,5}\, x_2^{0,5}$, then
a) the consumer is spending the same amount of money on the two commodities.
b) the consumer is buying the same amount of the two commodities.
c) the prices of the two commodities are equal.
d) the consumer will stop producing the commodities.

B32. If the consumer's utility function is $U = x_1^{0,4}\, x_2^{0,6,}$ then
a) the consumer will not buy commodity 1.
b) the consumer will buy more of commodity 1 than of commodity 2.
c) the consumer will buy more of commodity 1 than commodity 2, if commodity 1 is cheaper.
d) the consumer will spend more of his/her income on commodity 2 than on commodity 1.

B33. Goods A and B are perfect substitutes. The consumer's income increases. We will observe
a) the consumer buying more of both goods.
b) the consumer buying less of booth goods.
c) the consumer buying more of one of the goods, and buying less of the other.
d) the consumer buying more of only one of the goods.

B34. A producer finds, that the demand for its product is price-elastic. The producer can increase revenue if he/she
a) increases the price.
b) decreases the price.
c) decreases the quantity sold.
d) changes the consumers' preferences.

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B35. Price elasticity of demand tells us information about the connection between
a) the consumer's income and his/her willingness to pay for the good.
b) the quantity produced and the price of the product.
c) the change in the product's price and the change in the producer's revenue.
d) the change in the quantity of the factor of production used and the change in production.

B36. Which of the following would make the market demand for a given product less price-elastic (that is, make the consumers less price-sensitive)?
a) the consumers' income decreases
b) the price of the product increases
c) more firms producing in the market
d) less substitute products become available

B37. Suppose currently you are selling 100 pieces of a product at a price of 20 forint per piece. You know, that the price elasticity of your demand is –3 and is constant. You plan to decrease the price to 18. How many pieces can you expect to sell at the lower price?
a) 94
b) 103
c) 106
d) 130

B38. The consumer has to decide how much to buy of commodity A, which has a price of p_A. The consumer will increase consumption up to the point where
a) $MU_A = 0$.
b) $MU_A/p_A = 0$.
c) $MU_A = p_A$.
d) all the income is spent on commodity A.

B39. Which of the following will make the demand for my product less price-elastic?
a) My consumers' income decreases.
b) More companies enter my market as competitors.
c) The (average) price of substitute products increases.
d) The resources I use in production become cheaper.

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Solutions

A31. True
A32. False
A33. True
A34. True
A35. False
A36. False
A37. False

B31. A
B32. D
B33. D
B34. B
B35. C
B36. D
B37. D
B38. C
B39. C

Explanation to True of false questions

A31. If demand for a product is price-elastic, then revenue can be increased by lowering the price.

TRUE. Lowering a price by $\Delta p\%$ the quantity demanded will increase by $\Delta q\% > \Delta p\%$, so the revenue being $\Delta TR\% \approx \Delta p\% + \Delta p\% > 0$, so it increases.

A32. A consumer is willing to purchase a product as long as its marginal utility is positive.

FALSE. The consumer buys a product as long as the product gives him/her more utility than the things he/she has to give up. If marginal utility of a large 4K TV is slightly positive (it is somewhat better than my old CRT TV, but not that big deal), and its price is above half Million forints, I will probably not buy it.

A33. When a product has lots of substitutes, its demand is price-elastic.

TRUE. If I can choose from more options, I will be sensitive about the details of the individual options. If my favorite beer becomes more expensive, I might switch to other beers if available, but if that is the only option, I will not care that much.

A34. The consumer is only willing to buy a product if his/her reservation price is higher than the market price of the product.

TRUE. Reservation price basically gives you the price at which you are indifferent between buying and not buying. It is the price which would cover all your utility increase. If the price is lower than that, it means that you can get more benefit from buying than it costs. Notice the difference between this question and A32.

A35. If the price of commodity 1 is higher than the price of commodity 2, than the consumer will definitely buy more of commodity 1.

FALSE. We cannot say which of the two commodities the consumer will buy more of only based on the prices. It is more tempting to answer true if the statement would end "buy less of commodity 1.", but this would be

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also false, along the same explanation.

A36. Marginal rate of substitution is always equal to the price ratio.

FALSE. This is only true in the optimum. Optimization is possible exactly because this is false for any bundle other than the optimum. MRT is the ratio of the marginal utilities which can be higher or lower than the price ration depending on the quantity of the two commodities in the basket.

A37. Two consumers faced with the same prices and having the same income will necessarily choose the same consumption basket.

FALSE. Prices and income only tell you what bundles you can choose from, not what you will actually chose. If this were true, all assistant professors (who have officially set salaries) going into a Tesco would have to come out with the exact same things in their shopping bags. But tastes differ…

Explanation to single choice questions

B31. If the consumer's utility function is $U = x_1^{0,5} x_2^{0,5}$, then

This is a Cobb-Douglas type of utility function. We can write up the marginal utilities, the marginal rate of transformation and the optimal choice. optimal quantities will be $x_1=(0,5\cdot m)/p_1$ and $x_2=(0,5\cdot m)/p_2$

a) the consumer is spending the same amount of money on the two commodities.
This is a special attribute of the Cobb-Douglas utility functions. If you multiply the quantities in the optimal choice by the price you get $x_1\cdot p_1=0,5\cdot m = x_2\cdot p_2$.

b) the consumer is buying the same amount of the two commodities.
This only happens if the price of the two goods are the same, which we do not know.

c) the prices of the two commodities are equal.
The utility function does not tell us anything about the prices of the commodities.

d) the consumer will stop producing the commodities.
The consumer is not producing anything, the role of the consumer is consuming.

B32. If the consumer's utility function is $U = x_1^{0,4} x_2^{0,6}$, then

See previous question.

a) the consumer will not buy commodity 1.
In the Cobb-Douglas case the consumer will always buy of both commodities.

b) the consumer will buy more of commodity 1 than of commodity 2.
We would need the prices to be able to tell this.

c) the consumer will buy more of commodity 1 than commodity 2, if commodity 1 is cheaper.
It is possible, but we do not know. All we see from the utility function is that the consumer spends a smaller part of his/her income on commodity 1 than on commodity 2. If the former is just slightly cheaper, this might not be enough. But if it is enough cheaper, the statement might be true.

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d) the consumer will spend more of his/her income on commodity 2 than on commodity 1.
This is what we can see from the utility function, where the exponents of the commodities tell us what share of his/her income the consumer will spend on the corresponding good.

B33. Goods A and B are perfect substitutes. The consumer's income increases. We will observe
If the goods are perfect substitutes, this means that the indifference curves are straight line, and the marginal rate of substitution is constant. We will have a corner solution for the optimal choice meaning a bundle with only one of the commodities in it.

a) the consumer buying more of both goods.
As the income rises this does not change the price ratio. So if originally the optimal choice was to buy only one of the goods, the same will be true after the income change.

b) the consumer buying less of booth goods.
An income increase will never induce a consumer to buy less of both goods, that would mean going below the (original!) budget line, which can never be an efficient way of spending the income.

c) the consumer buying more of one of the goods, and buying less of the other.
If it is worth to buy less of the one and more of the other, why not go all the way until only buying of one of the products? That is exactly what happens in the original situation: we will get a bundle with only one of the commodities in it. But from then buying less of the other does not make sense.

d) the consumer buying more of only one of the goods.
Since the goods are perfect substitutes, the price ration determines which commodity to buy, and the income determines how much to buy. With the income change only the latter changes.

B34. A producer finds, that the demand for its product is price-elastic. The producer can increase revenue if he/she
The revenue is $TR=p\cdot q$, from where $\Delta TR\%\approx\Delta p\%+\Delta q\%$. Elastic demand means $\Delta p\%<\Delta q\%$.

a) increases the price.
Increasing p by a certain percentage the quantity demanded will fall more, so the product of the two, the revenue decreases.

b) decreases the price.
Decreasing the price by a certain percentage the quantity sold will increase more, thus the revenue goes up.

c) decreases the quantity sold.
This is actually the same like answer a), to decrease the quantity you have to increase the price, but then… see a)

d) changes the consumers' preferences.
Not a bad idea, but it is generally quite difficult, requires a long time and also costs a lot to change preferences. In the end, the profit might be decreasing.

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B35. Price elasticity of demand tells us information about the connection between

Basically elasticity is the ratio of a percentage change in quantity demanded and the percentage change in price. None of the answers is exactly this, so we need to think what else it tells us about.

a) the consumer's income and his/her willingness to pay for the good.

Though elasticity does depend on the consumers' income, it does not tell anything about it directly.

b) the quantity produced and the price of the product.

We are talking about demand elasticities: they have nothing to do with supply.

c) the change in the product's price and the change in the producer's revenue.

By telling us about the relationship between price change and quantity change we can infer how the revenue will change because $\Delta TR\% \approx \Delta p\% + \Delta q\%$

d) the change in the quantity of the factor of production used and the change in production.

See answer b)

B36. Which of the following would make the market demand for a given product less price-elastic (that is, make the consumers less price-sensitive)?

Market demand elasticity tells us about how sensitively our consumers react to price changes on average. Think about what would make them care less about the price of the product.

a) the consumers' income decreases

Income decrease means the consumers have less income to ration to different consumptions. Now they will think twice what and how much to buy.

b) the price of the product increases

As we move up the demand curve, demand becomes more price elastic, not less.

c) more firms producing in the market

This is more in connection with the supply. But if we want to relate it to demand we would say more substitutes are available, so consumers will be more sensitive to changes in the price of any one specific variant: it becomes easier to switch.

d) less substitute products become available

Think of it in the extreme: If there is only one substitute product, you would probably buy the cheaper, so if the price of one goes up, you immediately switch to the other. If there are less substitutes (none), you do not care that much what happens to the prices: there is only one variant, that is which you have to buy, whatever the price (well, if it is too high you can still decide not to buy at all)

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B37. Suppose currently you are selling 100 pieces of a product at a price of 20 forint per piece. You know, that the price elasticity of your demand is –3 and is constant. You plan to decrease the price to 18. How many pieces can you expect to sell at the lower price?

$\varepsilon = (\Delta q\%)/(\Delta p\%) = -3$, this means that the percentage quantity change is three times as big (and in the opposite direction) as the percentage price change.

a) 94

You would get this result if you are not thinking in percentages and also get the direction wrong. Price decreased by 2, so you automatically decrease quantity by 3-times as much, so by 6.

b) 103

Is the result if you disregard that the price change now is not 1, but 10 percent.

c) 106

The same as answer a), but this time at least the direction is right: lower price, higher quantity.

d) 130

*The change in the price is –10% ((18 – 20)/20*100) so the change in quantity is –3-times as much, that is +30%*

B38. The consumer has to decide how much to buy of commodity A, which has a price of pA. The consumer will increase consumption up to the point where

The consumer is a utility maximizer, so sets costs (what he/she has to give up) and benefits (what he/she earns) against each other.

a) $MU_A = 0$.

This means the consumer would go to the point where his/her gain falls to zero. This would only be true if the consumer should not have to pay for consumption.

b) $MU_A/p_A = 0$.

This is actually the same as answer a). But this wants to trick you into remembering Gossen's 2nd law and misuse it for a case where there is only one good.

c) $MU_A = p_A$.

The consumer can increase utility if what he/she gives up is less valuable than what he/she gains. If it is, he/she has to keep on consuming until the two side becomes equal and then stop. Actually this is quite similar to answer b), but this time rearranging you get $MU_A/p_A = 1$.

d) all the income is spent on commodity A.

It does not sound reasonable that whenever you see a product you spend all your income on it. For example if the product is watermelon, the day I get my salary I should buy like 1,5 tons of it!

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B39. Which of the following will make the demand for my product less price-elastic?

Try to imagine whether the following events would make my consumers more or less sensitive to changes in the price.

a) My consumers' income decreases.

With less income they would probably start to care more if I increased my price a little. At least more than before the income decrease.

b) More companies enter my market as competitors.

More competitors mean more substitute products, and more substitute products mean higher price elasticity

c) The (average) price of substitute products increases.

This is a kind of opposite to answer b). As the price of substitute products increase, my consumers will start to regard them less and less good substitutes and will be willing to buy my product even if I increased the price a little.

d) The resources I use in production become cheaper.

This has absolutely nothing to do with price elasticity. My consumers have no idea about how much the resources I use cost, and they also don't care much.

Detailed definitions with page references

(Ch 5)

Rationality: a basic assumption about human behavior. We assume that people in their choices aim at maximizing result for a given effort, or minimizing effort for a given result.

If you know all the alternatives and you have preferences over the alternatives, rationality dictates that you choose the most preferred of the alternatives. If people are rational, that means that they do not choose just at random. You can understand why they choose what they do if you study their preferences and their options. If people were irrational, it would mean that there were no logic in their choices.

Optimal choice: the consumer spends his/her income optimally, if he/she chooses that bundle from the budget line that has the highest utility.

Graphically the optimal bundle is where the budget line is tangential to the highest indifference curve that it still has a common point with. Since they are tangential, at the optimal points they have the same slope, that is the marginal rate of substitution is equal to the price ratio. So in the optimum, the consumer is willing to give up exactly that much of one commodity for the other as he/she has to give up. Also the marginal utility per unit of money is the same for both commodities (p.73-74)

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(Ch 6)

Normal good: if quantity demanded increases as a result of a ceteris paribus increase in the consumer's income, it is a normal good.

> *For a normal good, the Engel curve (or income-demand curve) is upward sloping. The richer one becomes (the higher income one earns) the more one wants to buy of such goods. Such normal goods are for example clothes, diners in a restaurant, or books (p.96)*

Inferior good: is a good of which consumers buy less if their income becomes ceteris paribus higher.

> *The Engel curve is downward sloping. Higher income means less consumption. Examples include margarine, pork meat products or beer from tap. These are not necessarily bad quality products, it is just that there exists a more expensive and better variant of them. If the consumer's income increases, he/she switches to this variant (p.96)*

Ordinary good: if an increase in the price of a good induces the consumer to buy less of it, it is an ordinary good.

> *The negative relationship between the price and the quantity demanded means that for ordinary goods the ordinary demand function is downward sloping. This is because the more expensive a product gets, the more consumers will substitute away from it, they will buy less of this specific product and try to find ways to satisfy their needs in a cheaper way (p.106)*

Reservation price: is the highest price that a consumer is willing to pay for a given quantity of the good.

> *Due to the law of diminishing marginal utility, the more of a product we want to sell to a consumer, the less the consumer will be willing to pay for an additional unit. For this reason the demand function for most goods is downward sloping. Reservation price is not one exact price, it depends on the quantity (p.109)*

Substitute products (or simply: substitutes): A and B are substitute products, when an increase in the price of A results in a consumer buying more of B.

> *Higher price of A induces the consumer to buy less of A, and instead, buying more of B. These are products that are same in function, satisfy the same kind of need or want, but are somewhat different in detail (like different in design, brand etc. for example: Cola and Sprite) (p.111)*

Complementary products (or simply: complements): A and B are complements when as a result of an increase in the price of A the consumer would buy less of B.

> *For whatever reason the consumer uses (buys, consumes) these products together. When the price of A increases, the consumer will buy less of A, but then he/she also needs less of B to go together with it. Examples might be tennis rackets and tennis balls, movie tickets and popcorn etc. (p.112)*

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(Ch 15)

Price elasticity of demand: It shows that a one percent change in the price of a product would result in a what percentage change in its quantity demanded.

> *If the prices changes, people will react to this price change. Elasticity gives the sensitivity of this reaction. Having a starting and a final price and quantity demanded combination elasticity will be the percentage change in quantity divided by the percentage change in price. If price and quantity move in the opposite direction, elasticity will be negative (p.274-275)*

Price-elastic demand: demand is price-elastic if one percent change in the price changes the quantity demanded by more than one percent.

> *This means that buyers react sensitively to changes in the price: even a small change in the price causes a relatively big change in the quantity demanded. Price-elasticity of demand will be smaller than –1 (p.276)*

Price-inelastic demand: demand is price-inelastic if one percent change in the price changes the quantity demanded by less than one percent.

> *Buyers don't react very sensitively to changes in the price: even bigger changes in the price result in relatively small changes in demand (in both directions). Price-elasticity of demand is between –1 and 0 (p.276)*

Consumers' surplus: it shows how much higher a given quantity of goods purchased is valued by the consumers than what they had to pay to obtain that quantity.

> *For a given unit of good consumers surplus is the difference between the reservation price (that is, the highest price that I would be willing to pay for that specific unit) and the market price (which is the price that I actually had to pay for it). I will only buy a product, if my reservation price for that unit is higher than the market price.*

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Topic 4: Producers' Choice 1: Technology and Production (Chapters 18-21)

Topic overview

In topics 4-7 we turn to the producers and look behind the supply function. We concentrate on two areas in this topic: production and costs.
The primary function of firms in microeconomics is produce. Under production we will simply understand the transformation of inputs (of factors of productions) into output. In microeconomics we will not ask questions like what type of machines are used in production, of how big is the factory building, or how many divisions does the firm have, or what is the organizational (or ownership) structure of the company. We will only care about what combination of inputs go in, and what quantity of the final product comes out. What happens inside the "black box of production" is entirely described by the production function, and that comprises every information that is relevant to us in a microeconomic sense of the word.
In the second step we will say that the firms are not so much interested in the quantities of the factors of production coming in (as long as they are able to produce using them), but more in the value of those factors of production, the money they had to pay for them. Cost functions will link the quantity of the goods produced to the costs of the factors of production employed.
Everything we describe in this topic is independent of the market form the producing firm operates under. The technical issues of production mentioned in this topic are just as valid for a competitive firm as for a monopolistic or oligopolistic producer.

Learning outcomes

- *Students became capable of identifying the factors of production that firms use in the production process*
- *Students will learn about the significance of the law of diminishing marginal returns, as an important constraint for firms to produce as much as they want*
- *Students will be able to link costs to the usage of factors of production*
- *Students will once again realize how important optimization is: how using too much or too little of the factors of production is disadvantageous for firms*

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Definitions

(Ch 18)
Factors of Production: are resources that companies use during the process of production to manufacture a product or offer a service.

Production function: gives the maximum amount of output producible for every input bundle.

Marginal product: tells how much additional production results if the company ceteris paribus increases the usage of an input by one unit.

Short run: is that time period during which a company has some inputs the quantity of which is fixed, but some inputs the quantity of which can be changed.

Long run: is that time period during which the quantity of all the inputs that a company use can change, neither of them is fixed.

Returns-to-scale: in the long run it shows the relationship between an increase in all inputs to the same degree and the resulting increase in production.

(Ch 19)
Condition for Profit-maximizing input usage: the company maximizes profit in the short run if it uses that quantity of its variable input for which the value of the marginal product attributable to that input is equal to the price of the input.

(Ch20)
Total cost: gives the minimum market value of all the fixed and variable inputs needed to produce a certain quantity of goods, as a function of the output.

(Ch 21)
Marginal cost: shows the additional cost that would result from producing one additional unit of the output.

Average cost: shows the per unit cost of production as a function of the quantity produced.

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True or False questions

A41. If the price of a factor of production increases, the production function shifts to the left.
A42. The slope of the short run production function is the marginal product.
A43. A producer will always produce that quantity for which average cost is the lowest.
A44. In the short run, average variable cost is always smaller than average cost.
A45. On the long run, when there is increasing returns-to-scale, the average cost is decreasing.
A46. Given the input prices higher total cost means also a higher average cost.
A47. If the marginal is smaller than the average, the average decreases.
A48. Given the input prices increasing marginal cost means also increasing average cost.
A49. When the price of a factor of production increases, companies using that factor will likely decrease production.
A410. Companies do not have average cost in the long run.
A411. If a firm is too big (over the optimal plant size), the returns-to-scale of production is increasing.
A412. If marginal product would not decrease, marginal cost would not increase.
A413. If you employ a worker who adds more to the production than his wage divided by the price of the product, your profit will increase.
A414. Acquiring more capital in the long run will shift the production function to the left.

Single choice questions

B41. Which of the following functions does NOT have a maximum?
a) the demand function.
b) the production function.
c) the marginal utility function.
d) the average cost function.

B42. Which of the following is the condition for optimal factor usage for a competitive firm in the short run?
a) $MRS = p_1/p_2$.
b) $MP_1 = w_1/P$.
c) $MR = MC$.
d) $P = AC_{min}$.

B43. For a company the condition for the profit maximizing input usage is
a) $MP_1 = AP_1$
b) $MP_1 = w_1/P$
c) $MR = P$
d) $P = AC_{min}$

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B44. For the current quantity of labor used by the company we know that $w/P > MP_L$. In this case,
a) the company should decrease the price of labor used.
b) increase the price of its product.
c) use less workers.
d) produce more.

B45. When the wage the company has to pay to the workers increases, which function will be moved?
a) the demand function.
b) the production function.
c) the average variable cost function.
d) the utility function.

B46. In the short run, average product is maximum when
a) $AP = 0$
b) $MP = 0$
c) $Q = P$
d) $AP = MP$

B47. When the marginal cost function is constant, then…
a) the total cost function is linear.
b) the average cost is linear.
c) the price of the factor of production is constant.
d) the marginal utility of the product is also constant.

B48. Your company's return-to-scale is increasing. If you increase the size of your company, you can be sure that
a) total cost will increase to a smaller degree than production.
b) price will increase to a greater degree than total cost.
c) total revenue will increase to a smaller degree than total cost.
d) input usage will not be optimal.

B49. Which of the following can not be considered as a cost of current production?
a) Employing workers for 100000 Ft a month.
b) Renting a building where production takes place for 500000 Ft per month.
c) Buying equipment used in production for 10000000 Ft.
d) Buying raw material used in production for 2000000 Ft.

B410. Which of the following does not exist in the long run?
a) *AP*.
b) *MC*.
c) *AC*.
d) *AFC*.

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Solutions

A41. False
A42. True
A43. False
A44. True
A45. True
A46. False
A47. True
A48. False
A49. True
A410. False
A411. False
A412. True
A413. True
A14. False

B41. D
B42. B
B43. B
B44. C
B45. C
B46. D
B47. A
B48. A
B49. C
B410. D

Explanation to True of false questions

A41. If the price of a factor of production increases, the production function shifts to the left.
FALSE. How much a unit of a factor of production is able to produce is a purely technical, given thing. The production function only shift if we change the quantity of the fixed factor, or if technology changes.

A42. The slope of the short run production function is the marginal product.
TRUE. This is the definition of marginal product.

A43. A producer will always produce that quantity for which average cost is the lowest.
FALSE. The company's objective is not the lowest average variable cost but the highest profit.

A44. In the short run, average variable cost is always smaller than average cost.
TRUE. AC = AVC + AFC, and in the short run AFC is positive.

A45. In the long run, when there is increasing returns-to-scale, the average cost is decreasing.
TRUE. When there is increasing returns-to-scale increasing input usage the total cost increases linearly but the increase in production will be disproportionately bigger, so AC = TC/q necessarily decreases.

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A46. Given the input prices higher total cost means also a higher average cost.

FALSE. It is possible, but we do not know for sure. If the input prices do not change higher total cost means we are producing more. Average cost initially decreases with production and subsequently rises, so we cannot tell from the information we have where we are on the average cost curve.

A47. If the marginal is smaller than the average, the average decreases.

TRUE. Think about pouring a litre of water of a certain temperature into a bathtub. If you pour colder water in it (marginal) than the current temperature (average), the temperature will go down a little.

A48. Given the input prices increasing marginal cost means also increasing average cost.

FALSE. If marginal cost is increasing but is smaller than the average, the average will go down.

A49. When the price of a factor of production increases, companies using that factor will likely decrease production.

TRUE. Higher factor price will lead companies to use less of that factor, and less factor usage means smaller production.

A410. Companies do not have average cost in the long run.

FALSE. It is average fixed cost that they do not have in the long run. They do have average cost, it is just the same as average variable cost.

A411. If a firm is too big (over the optimal plant size), the returns-to-scale of production is increasing.

FALSE. It is tempting to connect "too big" and "increasing", but increasing returns-to-scale means you can grow, because it is profitable to be bigger. If you are too big, the opposite is true: returns-to-scale must be decreasing (and at the same time LRAC increasing).

A412. If marginal product would not decrease, marginal cost would not increase.

TRUE. If resources (like workers) have at least the same productivity (so constant marginal product), you always need the same additional units to produce one more unit of output. And if the unit price of the resource is also constant, the additional cost of one more unit of output would be the same. If resource productivity is increasing, than you would need less and less of it for an additional unit of output, so marginal cost would decrease.

A413. If you employ a worker who adds more to the production than his wage divided by the price of the product, your profit will increase.

TRUE. The cost of employing a worker is his/her wage. The benefit is what he/she produces (marginal product) times the price (for what you can sell it). If additional benefit is higher than cost, the profit will increase.

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A414. Acquiring more capital in the long run will shift the production function to the left.

FALSE. The short run production function is for a certain fixed level of capital. If you change capital, the production function will shift. But employing more capital would mean that a certain number of workers can now produce more than before, so the production function would shift to the right.

Explanation to single choice questions

B41. Which of the following functions does NOT have a maximum?

The maximum of a function is a value above which it does not go. So try imagining whether you can increase any of these to infinity.

a) the demand function.

Price, or willingness to pay is on the vertical axis. Clearly it can not rise infinitely: there can always be a price high enough that would discourage the most determined buyer from buying.

b) the production function.

Quantity produced is on the vertical axis. In the long run we have fixed inputs (like the factory building we are producing in), which sooner or later acts as a bottleneck. However you increase the variable inputs, using more and more of them, there is a certain capacity limit to the factory building.

c) the marginal utility function.

Utility is on the vertical axis. When the consumer consumes more and more, sooner or later he/she gets satiated, and from then on, further consumption will not increase utility, it may downright decrease it (so too much of a good can be bad).

d) the average cost function.

Average cost is on the vertical axis. Because of the fixed input mentioned in answer b) if you keep on trying to increase production, you will see per unit cost skyrocketing practically to infinity.

B42. Which of the following is the condition for optimal factor usage for a competitive firm in the short run?

We are looking for the point up to which it is profitable to increase factor usage. We even have a definition for it.

a) $MRS = p_1/p_2$.

This is in connection with the consumer, not the firm. This is the consumer's optimal choice condition.

b) $MP_1 = w_1/P$.

This is the only option we can connect to factor usage at all, since this has the factor price in it on the right hand side, and *MP*, which depends on factor usage on the left hand side.

c) $MR = MC$.

This does give some indication about optimum input usage, but only indirectly. This is the condition for optimal production.

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d) $\varepsilon = dQ/dP \cdot P/Q$.

This has nothing to do with either optimality or the firm, this is the formula for price elasticity.

B43. For a company the condition for the profit maximizing input usage is

See previous question.

a) $MP_1 = AP_1$

This one is about input usage, but rather tells you where the average product is at its maximum.

b) $MP_1 = w_1/P$

c) $MR = P$

This is a specific characteristics of the perfectly competitive market, and is not even an optimum condition.

d) $P = AC_{min}$

Again this is not an optimum condition, this is the break-even point for a perfectly competitive firm.

B44. For the current quantity of labor used by the company we know that $w/P > MP_L$. In this case,

Rearranging what we know we get $w > MP_L \cdot P$, so the value of marginal product is smaller than the wage.

a) the company should decrease the price of labor used.

If the firm is a perfectly competitive firm it can not do much about the price of the factors of production it buys. One firm by itself is too small to affect the labor price.

b) increase the price of its product.

A competitive firm again is too small to have any affect on the price of the product it produces. This is why we call it price taker.

c) use less workers.

Deciding about how much workers to employ is for the firm to do. The firm takes the prices (of its product and of labor) as given, and adjusts the number of workers employed so that it is optimal. Now the last worker costs more than the extra revenue it brings in, so the company will reduce the number of workers, and fire the least productive worker(s) first, until the optimum condition is met.

d) produce more.

To produce more the company needs more workers. But if the last workers are already producing less value than what the company pays out in wages, then additional workers would reduce profit even more.

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B45. When the wage the company has to pay to the workers increases, which function will be moved?

The wage is the price of the variable factor of production in the long run, is a part of the cost of the company.

a) the demand function.

Wages have nothing to do with how much consumers want to buy of the goods. Probably we, as consumers don't even have any idea how much wage for example Apple pays to whoever assembles iPhones.

b) the production function.

Wages do not affect how productive the workers are, at least not in our model. If one worker could produce 10 units before the wage rise, he/she will be able to produce the same 10 units after.

c) the average variable cost function.

This is the only answer in connection with costs. And we also see the word "variable" in it, referring to labor as the variable factor. Average fixed cost would not change, average cost and marginal cost would.

d) the utility function.

Utility is even further from wages than demand in answer a)

B46. In the short run, average product is maximum when

Average product, as a function of the input used is positive rising till its maximum, then it falls

a) $AP = 0$

This cannot be the maximum. This would mean that at best every employer can produce 0 units of product.

b) $MP = 0$

This is the maximum of the production function. Until $MP > 0$, the production increases, when $MP < 0$, production falls.

c) $Q = P$

These are in totally different measure. Quantity is in kilogram, price is in Forint per kilogram. Can we find a product at all, of which exactly that much is produced as its price? It is certainly not Ferraris.

d) $AP = MP$

Every average increases until the marginal is higher than the average and falls when the marginal is lower. So the maximum of the average is necessarily where average equals the marginal.

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B47. When the marginal cost function is constant, then…

Constant marginal cost means that every additional unit of production means the same extra cost.

a) the total cost function is linear.

The marginal cost is the derivative of the total cost. So if marginal is constant, that means the total has always the same slope. Only linear functions are like this.

b) the average cost is linear.

Because we can have fixed cost, the average fixed cost will always be hyperbolical(ly decreasing), making the average cost also hyperbolical.

c) the price of the factor of production is constant.

The price of factors of production is always constant for a competitive company. $MC = P_L/MP_L$, so for a constant MC it is required that the marginal product be constant.

d) the marginal utility of the product is also constant.

Marginal utility has nothing to do with costs. Marginal utility is consumer valuation.

B48. Your company's return-to-scale is increasing. If you increase the size of your company, you can be sure that

Increasing returns to scale mean that in the long run output will increase more than input usage.

a) total cost will increase to a smaller degree than production.

When you increase input usage of all inputs to the same degree, total cost will necessarily increase to the same degree.

b) price will increase to a greater degree than total cost.

Perfectly competitive companies can not influence the price of their product. Not if they become twice as big, not if they shrink so much they go out of business.

c) total revenue will increase to a smaller degree than total cost.

For a perfectly competitive firm revenue increases linearly with production, cost increase linearly with input usage

d) input usage will not be optimal.

We do not have enough information to tell anything about optimality.

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B49. Which of the following can not be considered as a cost of current production?

Costs and monetary outlays are two different things. Some costs are also monetary outlays, some are not. Also some monetary outlays are not costs.

a) Employing workers for 100000 Ft a month.

This is a part of my variable cost. This is cost and money outlay too.

b) Renting a building where production takes place for 500000 Ft per month.

This is the prat of my fixed cost, a cost and at the same time a money outlay.

c) Buying equipment used in production for 10000000 Ft.

This is money outlay, but not a cost. It is an investment. I am going to use this equipment for years to come, it would be unjust to enter it as cost only in the first year. Rather, I will account in every year that I use it a fraction of this sum as depreciation, which is cost, but not a money outlay any more.

d) Buying raw material used in production for 2000000 Ft.

The raw materials I buy I generally buy it to use it in production. This is also a part of the variable cost, money outlay and cost too.

B410. Which of the following does not exist in the long run?

Long run means that you can change the usage and therefore the cost associated with any of your inputs

a) *AP*

You will still be able to calculate production per unit of input

b) *MC*

Increasing the usage of any of your inputs will affect both your costs and production, so you will be able to calculate MC.

c) *AC*

As long as you can calculate total cost and measure your production, you will be able to calculate average cost.

d) *AFC*

Fixed cost is associated with the usage of inputs the quantity of which you cannot change. In the long run, however, you don't have any inputs the usage of which you cannot change. You can reduce the usage of all your inputs to zero, so you will not have any fixed cost. Similarly we could say that there is no variable cost in the short run, or rather, that since every cost is variable, it does not make sense to call it such, just call it cost.

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Detailed definitions with page references

(Ch 18)

Factors of Production: are resources that companies use during the process of production to manufacture a product or offer a service.

> *These are the ingredients of production. Part of it is the raw material that goes directly into the product. But to get a final product done most companies need some kind of machinery (we call this capital) and human work (we call this labor) (p.332-333)*

Production function: gives the maximum amount of output producible for every input bundle.

> *Firms use combinations of inputs to produce just as consumers consume combinations of products. These are the input bundles. The production function tells the company that if it uses x1 units of input 1, x2 units of input 2 etc., what is the maximum amount of the final product it can possibly produce. It is analogous to the consumer's utility function (p.333)*

Marginal product: tells how much additional production results if the company ceteris paribus increases the usage of an input by one unit.

> *It is also called marginal return. It is similar to the consumer's marginal utility, only better measurable. If you use workers to produce, and you employ one more worker, either the work will be done earlier, or more work will be done during a given time. In this case marginal product is positive, adding one more worker adds to the production (p.338)*

Short run: is that time period during which a company has some inputs the quantity of which is fixed, but some inputs the quantity of which can be changed.

> *In the short run the company has less opportunity to adjust. Some of its input it has to use in fixed quantities resulting from earlier decisions (like buildings or machinery that the company bought earlier), but it can decide about the quantity of some of the inputs used (like how many workers they want to employ) (p.340)*

Long run: is that time period during which the quantity of all the inputs that a company use can change, neither of them is fixed.

> *In the long run the company has opportunity to adjust to changes, and can vary the quantity of any of the inputs it employs. If the time period is long enough the company can decide to build new buildings or sell existing ones, just as to employ more or less workers. None of the input is used in fixed quantities, all of them is considered variable. (p.340)*

Returns-to-scale: in the long run it shows the relationship between an increase in all inputs to the same degree and the resulting increase in production.

> *In the long run if a company increases the usage of all its inputs to the same degree, and production increases to a greater degree, we call it increasing returns-to-scale. If production increases to a smaller degree, it*

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is decreasing returns-to-scale (p.340-343)

(Ch 19)

Condition for Profit-maximizing input usage: the company maximizes profit in the short run if it uses that quantity of its variable input for which the value of the marginal product attributable to that input is equal to the price of the input.

If using one additional unit of input produces more extra revenue to the firm (that is the value of the marginal product) than extra cost (which is the price of the input), than employing this one additional unit will increase profit. If the resulting extra revenue is smaller than the extra cost, it is not worthy to employ this additional unit. To put the condition in another way we can say the marginal product has to be equal to the price of the input over the price of the product (p.351)

(Ch 20)

Total cost: gives the minimum market value of all the fixed and variable inputs needed to produce a certain quantity of goods, as a function of the output.

The production function tells you what input bundle you will need to produce a certain quantity of the output. If you know what inputs and in what quantity you need you can go to the market and buy those inputs at the going input prices: this will be the total cost of production. If you want a different quantity, you will need a different input bundle, so the cost will change accordingly (p.365)

(Ch 21)

Marginal cost: shows the additional cost that would result from producing one additional unit of the output.

It is the slope of the total cost function and can be calculated as the increase in the total cost divided by the increase in the quantity of the output. The intuition behind marginal cost being positive is that if you want more production, you will need to use more resources, and more resources have higher cost (p.380)

Average cost: shows the per unit cost of production as a function of the quantity produced.

The production function will tell you with which input bundle you can produce a certain quantity the most economically. Using the input prices you can find out how much in total the production of that quantity of output will cost you. If you divide this total cost by the quantity of output you get average cost showing how much on average every unit of output costs you (p.379.)

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Topic 5: Market Forms 1: Perfect Competition (Chapters 22-23)

Topic overview

In the last three topics we turn to the output markets, and the revenue-side of production to find out that the strength of competition in the output market is a very important information for a firm, and one crucial to determine what quantity to produce of the product, and perhaps also what price to set.
The first market form of interest is the pure or perfect competition, the subject of topic 5. This market is characterized by strong competition meaning a large number of competing firms each producing the very same product. Having many competitors will mean that any single firm has little, negligible – actually in the model: zero – market power. No market power means that these competitive firms can not influence the price of their product on the market, they can only accept the price dictated by the market. Thus, they will only have to decide on how much to produce to get the most possible profit.
There is a whole spectrum of market structures differentiated mostly based on the number of competitors and the nature of the good produced by the producers. Pure or perfect competition is one extreme of this spectrum. As with most extremes, this particular one is also interesting not so much because of its realism, but because it can serve as a kind of reference point for all other market structures or market forms. Our findings will be true inasmuch as reality is close enough to the idealized model of pure competition. But remember, just because there is no frictionless world, it is still useful to scrutinize how such a world would work. The same goes for perfect competition.

Learning outcomes

- *Students will be able to differentiate between different market forms*
- *Students will be aware of the limitations of the model assumptions, and be able to think within the framework of the model*
- *Students will understand and able to use the logic of price taking*
- *Students will once again see an example of optimization, becoming more familiar with the notion of cost-benefit analysis, when too much or too little of something is not optimal*
- *Students will realize that behind the rising supply curve there is the competitive optimization behavior*

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Definitions

(Ch 22)
Pure/Perfect competition: is a market form where every participating firm assumes that the market price of the product is independent of its own level of output.

Firm supply: for any price it will show what quantity a profit maximizing price taker firm would choose to produce.

Shutdown price: for a competitive company it is the lowest possible average variable cost. If the price falls below this, the competitive company will no longer produce even in the short run.

Producer's surplus: is equal to total revenue minus variable cost. Firms are willing to produce so long as the producer's surplus is positive.

(Ch 23)
Industry supply: gives for any price the quantity that all firms in an industry combined would be willing to produce and bring to the market.

Breakeven price: for a competitive company it is the lowest possible average cost at which price the maximum profit that a firm can have is exactly zero.

Long run equilibrium: in a competitive industry it is that situation when there is no incentive either for existing firms to exit from the market, or for new firms to enter the market, and all participants attain 0 profit.

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True or False questions

A51. When the price of the product falls in a competitive market, firms will, in the short run, decrease production.
A52. For a perfectly competitive company, increasing production always increases revenue.
A53. If the number of producers increases on a competitive market, the supply curve shifts to the right.
A54. When firms in a competitive industry can make positive profit, price of the product in the long run falls.
A55. When fixed costs increase, it has no effect on the optimal quantity a firm has to produce.
A56. Producers want to produce with the lowest possible average cost.
A57. If the price is lower than the breakeven price, the perfectly competitive firms stop producing.
A58. If companies can realize positive profits in the short run in a competitive industry, this will attract new companies into the industry.

Single choice questions

B51. The profit in a perfectly competitive industry is 0 in the long run because
a) the number of competitors is high.
b) every competitor produces exactly the same product.
c) firms are free to enter or exit the industry.
d) the price of the product is exogenously given to the firms in the industry.

B52. Suppose that in a perfectly competitive industry the price is higher than the breakeven price. What will happen in the long run?
a) more firms enter the market, and every firm is producing less as the price goes down.
b) firms will increase production until price goes down to the breakeven level, but the number of firms do not change.
c) The cost of production goes up, so the average cost function shifts up. Number of firms and firm production remain unchanged.
d) One of the firms acquire monopoly power and drive other firms out of the business.

B53. What happens if a perfectly competitive firm decides to decrease its price?
a) All competitors would be forced out of business.
b) It gains some more consumers.
c) The market price of the product also goes down to the level set by this firm.
d) Every buyer on the market would want to buy from this firm.

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B54. Which of the following is NOT true for a perfectly competitive industry?
a) Companies can realize profit in the short run.
b) Companies are producing a quantity of the product at which MC = P.
c) Demand for a single company's product is perfectly price-elastic.
d) Consumers distinguish between producers and pick the product that fits them best.

B55. The competitive firm's supply function is its MC function above
a) the market price.
b) the minimum of the MC.
c) the intersection of the AVC and MC.
d) the intersection of the AC and the MC.

B56. Which of the following products is produced in an industry closest to perfect competition?
a) Eggs.
b) Economics BA diplomas.
c) Taxi service.
d) Jeans.

B57. Why are perfectly competitive firms price takers?
a) Because they are satisfied with the price that prevails on the market.
b) Because they cannot make a larger profit using any price above or below the market price.
c) Because they are not allowed to write a different price on their price tag.
d) They are not, perfectly competitive firms are called price searchers.

B58. When the price of a good produced in a perfectly competitive market increases, then in the short run…
a) demand will fall, because firms cannot produce more.
b) production does not change, only the profit of the companies increases.
c) each firm is increasing the quantity they are producing, and earns higher profit.
d) the number of firms increase to meet the increased demand with constant firm level production.

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Solutions

A51.	True	B51.	C
A52.	True	B52.	A
A53.	True	B53.	D
A54.	True	B54.	D
A55.	True	B55.	C
A56.	False	B56.	A
A57.	False	B57.	B
A58.	True	B58.	C

Explanation to True of false questions

A51. When the price of the product falls in a competitive market, firms will, in the short run, decrease production.

TRUE. Firms want to produce the profit maximizing quantity, where MC = P. So at lower prices only units that can be produced at lower marginal cost will be produced. This is the same as saying that the units most costly to produce will not be produced, production decreases.

A52. For a perfectly competitive company, increasing production always increases revenue.

TRUE. Our model assumption is that more individual or company output does not change the price. TR = p·q, so if q goes up and p does not change, TR also goes up. Firms can always sell more at the going market price.

A53. If the number of producers increases on a competitive market, the supply curve shifts to the right.

TRUE. A right shift in the supply curve means higher quantity offered at every level of the price. 5 firms each producing 4 pieces of the product at the current price offered altogether 20. If now we have 7 firms they are offering 28 at the same price.

A54. When firms in a competitive industry can make positive profit, price of the product in the long run falls.

TRUE. Positive profit is an incentive to enter the industry. If more firms produce, supply increases. Increased supply will drive down the price.

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A55. When fixed costs increase, it has no effect on the optimal quantity a firm has to produce.

TRUE. Profit is maximized where MC = P. Fixed costs will neither change the price, nor the marginal cost, so the same quantity will be produced, but now at a lower profit. In the long run it certainly changes (lowers) the price, and then it does have an effect on the profit maximizing quantity.

A56. Producers want to produce with the lowest possible average cost.

FALSE. Producers want to maximize profits. They are willing to take higher than minimum average cost if that means that profits are still increasing.

A57. If the price is lower than the breakeven price, the perfectly competitive firms stop producing.

FALSE. This is a trap: do not mistake the breakeven price for the shutdown price. The price mentioned in the question would be the shutdown price. Below the breakeven price firms are willing to produce, it is just that they will run a loss.

A58. If companies can realize positive profits in the short run in a competitive industry, this will attract new companies into the industry.

TRUE. Positive profits together with no barriers to entry means more companies producing the same output per company, so the industry output will increase.

Explanation to single choice questions

B51. The profit in a perfectly competitive industry is 0 in the long run because

We know that in the long run profits are driven to 0. As you will see, all the answers are true for the perfect competition, but only one of them is required and sufficient to explain 0 long run profit.

a) the number of competitors is high.

Depends on what we call high. The model assumption is that there are infinitely many firms, but how many should we need to bring down profits to zero. Monopolistic competition also has many firms, but a non zero long run profit.

b) every competitor produces exactly the same product.

Also in a monopolistic, or a homogenous oligopolistic market firms produce the same product and profit is positive.

c) firms are free to enter or exit the industry.

Free entry and exit ensures that as soon as profit is just a little above or below zero, number of firms and price will change so that profit goes back to zero.

d) the price of the product is exogenously given to the firms in the industry.

Being exogenous does not explain why it will happen to be exactly that price that provides 0 profit.

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B52. Suppose that in a perfectly competitive industry the price is higher than the breakeven price. What will happen in the long run?

Prices higher than the breakeven price result in positive profit for the firms in the industry.

a) more firms enter the market, and every firm is producing less as the price goes down.

Because there is free entry, positive profit will induce firms to costlessly enter this industry.

b) firms will increase production until price goes down to the breakeven level, but the number of firms do not change.

The level of the price can not induce a change in the production. Firms always produce the profit-maximizing quantity, so just because they can get positive profit it does not mean they should increase production.

c) The cost of production goes up, so the average cost function shifts up. Number of firms and firm production remain unchanged.

Again, the level of the price does not induce changes. Only changes induce changes. But still, changes in the price of the product would not have any effect on the costs of production.

d) One of the firms acquire monopoly power and drive other firms out of the business.

Problem is all the firms are the same, so if one firm could acquire monopoly power, than any of them could. Assuming that one lowers the price to drive competitors out of the business (which is very unlikely, since we are talking about similar small firms) so that once alone he could raise the price high. But as soon as the price goes up again, the competitors would come back, as there is no barrier to entry. The only way to seize monopoly power would be to "invent" some barrier to entry. But then we are not talking about perfect competition any more.

B53. What happens if a perfectly competitive firm decides to decrease its price?

Firms are free to put any price tag on their product, so a firm could certainly do this.

a) All competitors would be forced out of business.

Not if this one specific firm is a small part of the whole industry. At lower price it would want to produce less. This lower quantity it could sell out in seconds and the disappointed buyers who will not be able to buy from this firm would go back to the competitors at the higher market price.

b) It gains some more consumers.

In some sense of the word. At lower price the firm would offer less of the product, so only less consumers will be served.

c) The market price of the product also goes down to the level set by this firm.

In perfect competition individual firm behavior does not affect the market price. This is a model assumption, and the reason for that is that individual firms are negligibly small part of the whole industry, one drop in the ocean.

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d) Every buyer on the market would want to buy from this firm.
Since the consumers are perfectly informed, everybody will know, that this firm is selling cheaper. Since products are identical, the product of this firm is just as good as that of the competitors. So every buyer will want to switch to this seller, and buy from it. Note that the result will be excess demand at this supplier, so even though every buyers would like to, only a few would be able to buy from this seller.

B54. Which of the following is NOT true for a perfectly competitive industry?
Think about the model assumptions of perfect competition and the resulting outcome (price, quantity, efficiency, profit)

a) Companies can realize profit in the short run.
In the short run positive profits are possible if the price is above the breakeven price.

b) Companies are producing a quantity of the product at which MC = P.
This is the profit maximizing condition for a perfectly competitive firm.

c) Demand for a single company's product is perfectly price-elastic.
A model assumption is, that the price is given, so at the going price the company can sell any quantity it can produce, but is not able to sell any at just a little higher price. Consumers would react extremely sensitively to price changes.

d) Consumers distinguish between producers and pick the product that fits them best.
Another model assumption is homogenous product, which means that every producer produces exactly identical products, there is no way the consumers can distinguish products of different producers.

B55. The competitive firm's supply function is its MC function above
For the competitive firm the profit-maximizing condition is MC = P, so for the different market prices it is going to choose production along part of its MC curve. There are, however, 2nd and 3rd order profit maximizing conditions too.

a) the market price.
if this was true, than as the market price changes, the size of the firm's supply curve would change too, and we said that the only thing not affecting the supply (curve) is the change in the price.

b) the minimum of the MC.
The 2nd order profit maximizing condition says, that at the profit maximizing output, the MC has to be upward sloping, and we have from the minimum of the MC the whole upward sloping section of the MC. The 3rd order profit maximum condition, however, sets a lower limit to the supply function above this level.

c) the intersection of the AVC and MC.
This is the shutdown point and the shutdown price. This is where the firm supply function starts.

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d) the intersection of the *AC* and the *MC*.

This is the breakeven point and breakeven price. The firm is willing to produce the quantity where MC = P for (some) prices below and above this too, so the supply function is going through this point, not begins there.

B56. Which of the following products is produced in an industry closest to perfect competition?

We have to think about an industry where there are many small producers, the product is homogenous, entry and exit is costless.

a) Eggs.

This is quite close to fulfill all the assumptions of perfect competition.

b) Economics BA diplomas.

In Hungary there are only a handful of places where you can earn an economics BA diploma. The market is regulated by the government, and entry is very costly.

c) Taxi service.

This is also a regulated market. You need a license to be allowed to drive a taxi. Think about the argument between taxi companies and the Uber. Also, the demand is too restricted to allow perfect competition.

d) Jeans.

Here the product is not homogenous (Jeans manufacturers trying hard to make their specific make distinguishable from the others), and also entry is not costless.

B57. Why are perfectly competitive firms price takers?

This is a question about what it means to take the market price, which is one model assumption of the perfect competition.

a) Because they are satisfied with the price that prevails on the market.

Whether they are or they are not, they still have to take it. In the long run, for example, the long run equilibrium price gives competitive firms only 0 profit: this is hardly satisfying.

b) Because they cannot make a larger profit using any price above or below the market price.

At higher prices, they could not sell any, so profit would be smaller. At lower prices they could not sell more than at the going price, so again, profit would be smaller.

c) Because they are not allowed to write a different price on their price tag.

They are free to write whatever price they like, but it just doesn't pay them to use any price different from the market price.

d) They are not, perfectly competitive firms are called price searchers.

Monopolies are called price searchers, perfectly competitive firms are indeed price takers.

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B58. When the price of a good produced in a perfectly competitive market increases, then in the short run…

The increase in the price is likely a result of an increased demand. The market demand shifts to the right, and meets the industry supply now at a higher price and larger quantity produced.

a) demand will fall, because firms cannot produce more.

If firms really could not produce more, than with the higher demand, the fixed quantity would be allocated to the consumers at a higher price.

b) production does not change, only the profit of the companies increases.

As a result of the higher price, the profit will indeed increase, but firms are going to react to this, because if originally P was equal to MC, than now it is not, so quantity needs to change.

c) each firm is increasing the quantity they are producing, and earns higher profit.

The first part comes from the supply function, and the second from the fact that the price is now further from the breakeven price.

d) the number of firms increase to meet the increased demand with constant firm level production.

In the short run, entry and exit are not possible, so the number of firms will not change. Even in the long run, when entry is possible, the higher price, beside increasing the number of firms in the industry, will decrease individual firm level production.

Detailed definitions with page references

(Ch 22)

Pure/Perfect competition: is a market form where every participating firm assumes that the market price of the product is independent of its own level of output.

Firms are also called price takers. If an industry is competitive, there are many small firms on the market producing the exact same (homogenous) product, each producing only a very small fraction of the whole market, and there are no barriers to entry to this industry/market (p.396)

Firm supply: for any price it will show what quantity a profit maximizing price taker firm would choose to produce.

The firm supply function is the company's marginal cost curve above the shutdown price (p.399)

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Shutdown price: for a competitive company it is the lowest possible average variable cost. If the price falls below this, the competitive company will no longer produce even in the short run.

It is where the average variable cost function intersects the marginal cost function. At this price the firm is indifferent between producing the profit maximizing quantity or not producing at all. In the first case the revenues are just enough to cover the variable costs, and the firm will take a negative profit amounting to –FC. In the second case there will be no revenue and no variable cost, and profit will again be –FC (p.401)

Producer's surplus: is equal to total revenue minus variable cost. Firms are willing to produce so long as the producer's surplus is positive.

If producer's surplus is positive it means, that after paying for the variable inputs the company still has at least some revenue left to pay for the fixed cost. If it is negative, the company will not produce. Producer's surplus is the difference between the minimum price at which a company is willing to produce a certain quantity and the actual price it gets for the product. It is also the profit plus the fixed costs (p.403)

(Ch 23)

Industry supply: gives for any price the quantity that all firms in an industry combined would be willing to produce and bring to the market.

It is the horizontal sum of the individual firms' supply functions which means that for every price we observe what the profit maximizing output of the 1., 2., 3. etc. firm would be, and add these up, and this is the quantity that the whole industry would willing to produce at that price. Industry supply is upward sloping with the price (p.413)

Breakeven price: for a competitive company it is the lowest possible average cost at which price the maximum profit that a firm can have is exactly zero.

If the prevailing market price is lower than this, the company will only be able to produce at a loss, or negative profit, and if the market price is higher than this, firms are able to make a profit. It is at the intersection of the average and the marginal cost curves (p.414, 416)

Long run equilibrium: in a competitive industry it is that situation when there is no incentive either for existing firms to exit from the market, or for new firms to enter the market, and all participants attain 0 profit.

If attainable profits were positive, new firms would come, increasing supply and driving down the price. If attainable profits were negative firms would leave the industry, decreasing the supply and driving up the price. In the long run equilibrium, profit is zero, the number of firms does not change and price is equal to the breakeven price (p.421-422)

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Topic 6: Market Forms 2: Monopoly
(Chapters 24-25)

Topic overview

This topic is about another extreme market form or market structure, when there is only one sole producer of a certain product. Here, the only producer is going to have 100%, or maximum market power. This enables the monopolist to set prices as well as determine the quantity it wants to sell, but not independent of each other. Maximum market power does not mean unconstrained power over prices and quantities. This is why the monopoly is also called price searcher: it has to search for the optimal price and quantity combination to get maximum profit. Monopolies have other ways to increase their profit through price differentiation, which is not possible in a competitive market.
Since monopoly is the other end of the spectrum of market forms, it is going to be useful to compare the two extreme market forms – pure competition and monopoly – under identical circumstances to determine if any of them is better or worse for any of the players (producers and/or consumers) from any point of view. We are going to use quantity traded, price, consumers surplus, producers surplus and deadweight loss to quantify the distributive and welfare effect of the different market forms. We will find that consumers and society in general is better off with a competitive market than with a monopoly.
All along we again have to keep in mind the assumptions defining a (pure) monopoly are just as unrealistic as the assumption of perfect competition with infinitely many infinitely small competitors. Still as any market is getting closer being a true monopoly in the microeconomic sense, our findings are going to be more accurate.

Learning outcomes

- *Students will be able to identify the difference between the logic of price taking and that of price searching*
- *Students will understand how a firm can take advantage of its market power*
- *Students will recognize the limitations of monopoly power*
- *Students will understand why it is important that governments regulate monopolies*

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Definitions

(Ch 24)
Monopoly: is an imperfectly competitive market form where there is only one producer producing and selling a certain product.

Social surplus: is the sum of the consumers' surplus and producers' surplus attributable to a market form.

Deadweight loss: welfare loss that is attributable to the smaller social surplus that an industry with smaller number of competitors creates, relative to the social surplus created by perfect competition.

(Ch 25)
Price discrimination: is the opposite of uniform pricing, when the company sells different units of the product at different prices.

True or False questions

A61. For a monopoly, increasing production always increases revenue.
A62. Only monopolies can charge prices higher than average cost.
A63. Total profit can be calculated as $q \cdot (AC - p)$.
A64. Monopolies make big profits because they can set any price they want for their product.
A65. Any firm can become a monopoly by charging low enough price to drive all competitors out of business.
A66. When there are barriers to entry to a market (eg. you need a licence to be allowed to produce) than the market is going to be monopolistic.
A67. Monopoly power enables the producer to set a price higher than marginal cost.
A68. Price discrimination is successful if you can find at least two groups of consumers with different willingness to pay.

Single choice questions

B61. If a monopoly succeeds in perfect (of first-degree) price discrimination, then
a) consumers surplus is higher than without price discrimination.
b) there is going to be excess demand on the market.
c) there is going to be excess supply on the market.
d) a higher quantity will be sold than without price discrimination.

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B62. For a monopoly, the marginal revenue is lower than the price, because
a) the price is equal to the marginal cost.
b) the monopolist is a price taker.
c) in order to sell more, the monopoly has to decrease the price on all units sold.
d) if the price increases, the monopolist's revenue increases.

B63. The monopolist's profit maximizing price will be higher than
a) the consumers' reservation price.
b) average cost of production.
c) marginal cost of production.
d) marginal rate of substitution.

B64. If a monopoly uses price discrimination
a) the consumers' surplus decreases.
b) the quantity sold may increase.
c) the monopoly' profit goes up.
d) all the above are true.

B65. Monopoly is bad for society as a whole, because
a) the consumer's surplus is smaller than it would be in a perfect competition.
b) the monopoly is causing deadweight loss.
c) the monopoly is making a positive profit.
d) there is only one company producing the product.

B66. Monopoly is bad for the consumers because
a) the consumer's surplus is smaller than it would be in a perfect competition.
b) the monopoly is causing deadweight loss.
c) the monopoly is making a positive profit.
d) there is only one company producing the product.

B67. When a monopolistic market is deregulated and barriers to entry decrease, which of the following will happen?
a) Demand for the product increases.
b) We will still have the same monopolistic firm, but it will make lower profits.
c) The number of firms will increase, and each firm will produce more than the monopoly.
d) The number of firms increases, price goes down and firm level profit decreases.

B68. When the profit-maximizing monopolist produces the quantity where *AC* is lowest,
a) the monopolist can still make a positive profit.
b) the maximum profit attainable is 0.
c) *MR* = *P*.
d) *MC* = *P*.

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Solutions

A61.	False	B61.	D
A62.	False	B62.	C
A63.	True	B63.	C
A64.	False	B64.	D
A65.	False	B65.	B
A66.	False	B66.	A
A67.	True	B67.	D
A68.	False	B68.	A

Explanation to True of false questions

A61. For a monopoly, increasing production always increases revenue.

FALSE. Increasing production means lower prices, but on all units sold. For a while the revenue increase from increased production exceeds the revenue loss from lower prices, but once we sell a lot, the latter effect will over compensate the former, and increasing production will actually decrease revenue. This is also in connection with price elasticity.

A62. Only monopolies can charge prices higher than average cost.

FALSE. If there is enough demand, in the short run also perfectly competitive companies can see market prices above average cost.

A63. Total profit can be calculated as $q \cdot (AC - p)$.

TRUE. This is true for any market form. What you have in the brackets is average profit.

A64. Monopolies make big profits because they can set any price they want for their product.

FALSE. Monopolies cannot charge any price they want, their choices are limited by the inverse relationship of demand between price and quantity. They can make profits because they can set prices above marginal cost, and it will not be driven away by competition because of the barriers to entry.

A65. Any firm can become a monopoly by charging low enough price to drive all competitors out of business.

FALSE. Even if you can drive your competitors out of the business with low prices, when you increase the prices again, they will return to business unless you can also raise some barriers to entry.

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A66. When there are barriers to entry to a market (eg. you need a licence to be allowed to produce) than the market is going to be monopolistic.

FALSE. Barriers to entry only cause imperfect competition, but not necessarily monopoly. If the barriers are high enough, for example in the case of the government only licensing one single firm, only then will there be a monopoly situation. Barriers to entry only mean that the market will definitely not be perfectly competitive.

A67. Monopoly power enables the producer to set a price higher than marginal cost.

TRUE. Because of the monopoly situation the demand curve that the producer faces is downward sloping. Because of this, for any positive quantity MR < P, and since the profit maximizing condition is MC = MR, the price will necessarily be above the marginal production cost.

A68. Price discrimination is successful if you can find at least two groups of consumers with different willingness to pay.

FALSE. Finding two groups of consumers with different willingness to pay is only one step. Another one is to identify who belongs to which group, and then make everybody pay their group's appropriate price. Everybody knows that tourists have higher willingness to pay, the question is how to ask higher price from the tourists without being unfair. For example, the Aquapolis waterpark in Szeged offers discount for people that can prove with their ID supplement that they live in Szeged (so are not tourists…)

Explanation to single choice questions

B61. If a monopoly succeeds in perfect (of first-degree) price discrimination, then

Perfect price discrimination means that everybody pays the maximum amount he/she is willing to pay for the product.

a) consumers surplus is higher than without price discrimination.

Price discrimination always aims at transforming consumers' surplus to producers' surplus, so the first must decrease

b) there is going to be excess demand on the market.

Perfect price discrimination is about getting from you whatever you are willing to pay above the production cost. Excess supply would be a result of a price below production cost.

c) there is going to be excess supply on the market.

It would not make sense to produce more than you can sell. If you find someone willing to pay a little more than the production cost, then sell to this person.

d) a higher quantity will be sold than without price discrimination.

Monopoly causes deadweight loss, which means some people will not get the product even though they would be willing to pay more than production cost. Now you are able to sell them for what they are willing to pay without lowering the price to the others.

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B62. For a monopoly, the marginal revenue is lower than the price, because

A marginal revenue lower than price would mean that when you want to sell more your revenue will increase by less than the price at which you are selling: how is this possible?

a) the price is equal to the marginal cost.

This is the profit maximizing condition of the perfect competition. In the monopoly case it will not even be true.

b) the monopolist is a price taker.

It is not. The monopolist is a price searcher, it has power to affect the market price within some boundaries of course.

c) in order to sell more, the monopoly has to decrease the price on all units sold.

It is true that by selling more at the new price your revenue will increase, but because the new price is smaller, you will get the smaller price on all the units you sell, not just the last one, and this makes your revenue increase smaller.

d) if the price increases, the monopolist's revenue increases.

This may be true for some, but not for any prices. Moreover we are now talking about the relationship between the price and the increase in the revenue, not about relationships between two increases.

B63. The monopolist's profit maximizing price will be higher than

The monopolist will look for the quantity at which marginal cost equals marginal revenue and then sets the price the consumers are willing to pay for that quantity.

a) the consumers' reservation price.

Consumers will not buy any of the product if the price is above their reservation price.

b) average cost of production.

Firms are willing to produce at prices lower than average cost. Though it is not very likely, it is possible than the profit maximizing price of the monopoly turns out to be below the average cost.

c) marginal cost of production.

Since for the monopoly marginal revenue is smaller than price, at the profit maximizing quantity price must be above the marginal cost.

d) marginal rate of substitution.

This is from the consumers choice theory. If we must relate it to here we would say that since the consumers optimize by setting equal the price ratio and the marginal rate of substitution, answer d) cannot be true.

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B64. If a monopoly uses price discrimination

The aim of price discrimination is to transform consumers' surplus into producers' surplus.

a) the consumers' surplus decreases.

This is one effect, but not the whole story, and not even the reason why monopolies do price discrimination.

b) the quantity sold may increase.

This is true, depending on the type of price discrimination and the type of the demand curve, but again not the whole story.

c) the monopoly' profit goes up.

This is the main reason why monopolies apply price discrimination techniques.

d) all the above are true.

All the answers are true, all are part of the effect of price discrimination.

B65. Monopoly is bad for society as a whole, because

When looking at the welfare and wealth distribution effects of the monopoly relative to perfect competition we mentioned a way how the effect of monopoly (power) on the total of consumers and producers, so on society can be assessed.

a) the consumer's surplus is smaller than it would be in a perfect competition.

This is true, but it only says something about one part of society: consumers.

b) the monopoly is causing deadweight loss.

This is the efficiency loss to society: some consumers could be made better off by buying the product at a price between the current price and the production cost, but the monopoly will not sell them because with uniform pricing it should lower the price to everyone, hurting its own interests.

c) the monopoly is making a positive profit.

This is true, but it only says something about one part of society again: producers this time

d) there is only one company producing the product.

Having 2 producers instead of 3 or 1 instead of 2 is neither good or bad for society unless it has an effect on the price, the quantity or the surpluses.

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B66. Monopoly is bad for the consumers because

When looking at the welfare and wealth distribution effects of the monopoly relative to perfect competition we mentioned 3 ways how the effect of monopoly (power) on the consumers can be assessed.

a) the consumer's surplus is smaller than it would be in a perfect competition.

This is what consumers care about: they get less of the product at a higher price, so consumers' surplus is decreasing on two accounts.

b) the monopoly is causing deadweight loss.

We cannot really tell who actually is losing the deadweight loss: the producers or the consumers. Actually most likely both.

c) the monopoly is making a positive profit.

Consumers don't care much about how much profit the companies are making. The best proof for that is that they mostly have no idea about how much profit companies are making.

d) there is only one company producing the product.

Consumers do not really care how many producers are producing the product. Actually even in a perfectly competitive situation they feel like it is just one company, since the products are homogenous, so they cannot tell a product of firm A from an identical product of firm B.

B67. When a monopolistic market is deregulated and barriers to entry decrease, which of the following will happen?

The prevailing monopolist situation is due to the high barriers to entry that potential newcomers are confronted with. If this decreases, the profit will be an incentive to the now cheaper entry.

a) Demand for the product increases.

The demand will not change as a result of the lower entry cost, most importantly because the consumers themselves may not even know about this! What we will rather see is a decrease in the price which results in a higher quantity demanded, with the demand function itself still unchanged.

b) We will still have the same monopolistic firm, but it will make lower profits.

The lower profit will be the result of the lower price, but the price will not change unless it is because competition, so more firms.

c) The number of firms will increase, and each firm will produce more than the monopoly.

The number of firms will in fact increase, and so will industry level output, but each of the firms will produce less than if they were in a monopoly situation.

d) The number of firms increases, price goes down and firm level profit decreases.

The monopoly profit together with the lower entry costs are luring new firms into this industry or market. As their number grows, industry level production increases, so the price will sink towards the marginal and average cost. Since the profit is $q \cdot (P - AC)$, as both factors decrease, firm profit will decrease too.

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B68. When the profit-maximizing monopolist produces the quantity where AC is lowest,

This then has to be at the intersection point of the monopolist's AC and MC functions.

a) the monopolist can still make a positive profit.

Combining the minimum AC condition, the profit-maximizing condition and the monopoly assumption, we get that AC = MC = MR < P, so the price is higher than average cost, and the monopolist makes profit.

b) the maximum profit attainable is 0.

This would be true for perfect competition (this is the breakeven point), but is not true for monopoly, since AC = MC = MR <P.

c) *MR = P.*

This is true for perfect competition, but not true for monopoly. For any positive quantities MR will always be lower than P. Now AC = MC = MR, but MR ≠ P.

d) *MC = P.*

This is the profit-maximizing condition for a competitive firm, but this is not true for monopoly. Now AC = MC = MR but since MR ≠ P, it follows that MC ≠ P.

Detailed definitions with page references

(Ch 24)

Monopoly: is an imperfectly competitive market form where there is only one producer producing and selling a certain product.

There are generally either natural or artificial barriers to entry to this market, deterring possible competitors to appear. There are no close substitute products for the product of a monopoly, so the monopoly and so the monopoly has an opportunity to set the price of its product, within the limits allowed by the demand curve. A monopoly is also called price searcher (p.439)

Social surplus: is the sum of the consumers' surplus and producers' surplus attributable to a market form.

In a given market, as the number of competitors increase, consumers' surplus will increase and producers' surplus will increase, but altogether social surplus will increase. So an always larger share of the increasing social surplus will go to the consumers and an always smaller share of it is going to the producers (p.448)

Deadweight loss: welfare loss that is attributable to the smaller social surplus that an industry with smaller number of competitors creates, relative to the social surplus created by perfect competition.

Because of the market power that comes with barriers to entry, imperfect competition raises the price over the marginal cost of production. So people will have to pay more for the product than it costs to produce it. This means that at least some people willing to pay the production cost will not be able to get the product, and this is a loss in efficiency, a ground for Pareto-improvement (p.447-448)

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(Ch 25)

Price discrimination: is the opposite of uniform pricing, when the company sells different units of the product at different prices.

> *Also called price differentiation. Different consumers will pay different prices for the different units of the good. Sometimes the price varies by groups of people (higher price for some people and lower price for others), sometimes by the quantity of the good someone buys (lower price if you buy more, higher if you buy less). The aim is to increase profit (p.462)*

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Topic 7: Market Forms 3: Oligopoly (Chapters 27-28)

Topic overview

The subject of this topic is a market form that is between the two extremes studied in the previous two topics, between pure competition and monopoly. The advantage of this market form is, that it is much more realistic than the other two, but as economics is always about trade-offs, the downside of this is that in return for being more realistic it also gets more complicated.
The main difference between oligopolistic behavior and the other two is strategic behavior. In the other two market forms individual firms could play the game without caring about how their competitors are going to react to anything they chose to do, either because their market share was too small (virtually zero in perfect competition), or too large (100%, having no competitors in monopoly). In the case of oligopoly, or even more in duopoly, what one firm is doing will have an effect on the opportunities of the other firms and vice versa. Thus, when a firm makes a decision, it should somehow estimate or forecast the reaction of the other firms. Unlike in the earlier market forms here the companies have to keep a close eye on their competitors and have themselves to react to their decisions. In this sense of the word it is than actually the oligopoly, where we can expect to observe fierce competition between firms in the market. We will see that outcome-wise the oligopoly is somewhere between the monopoly and the perfect competition too, the difference being the number of competitors.
Because of the fierce competition between and also the possible gains from collusion among oligopolistic firms the involvement of the government in this market form is important. This is where competition regulation legislation enters the picture.
Still it remains a question difficult to decide whether competition would totally disappear without government intervention to defend it, or would prevails even in spite of government intervention to restrict it.

Learning outcomes

- *Students will understand the importance and the logic of strategic interaction*
- *Students will realize that protecting competitors is different from protecting competition*
- *Students will acquaint themselves with the temporal variation of equilibrium: the steady state*
- *Students will have the missing link between competition as one extreme market form and monopoly as the other*
- *Students will understand how price competition work*
- *Students will acknowledge why government intervention is justifiable on oligopolistic markets*

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Definitions

(Ch 27)
Oligopoly: is an imperfectly competitive market form, in which there are only a few competitors producing a homogenous product in a market each of them facing a negatively sloped demand curve.

Collusion: is when two or more players or competitors in an oligopoly market chose not to compete with each other but rather to cooperate and set prices or quantity together.

(Ch 28)
Nash equilibrium: is a set of strategies for interdependent players in a game when none of the players has an incentive to unilaterally change his/her strategy.

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True or False questions

A71. When the number of identical competitors on a market increases (ceteris paribus), the equilibrium price of the product goes down.
A72. With advertising companies want to make the demand for their product less price-elastic.
A73. In an oligopolistic market the competing firms can increase their profit if they collude and keep prices high.
A74. In oligopolistic markets it can be profitable to advertise, while in monopolistic or perfectly competitive markets it can not.
A75. The higher the number of competitors in an oligopolistic market the lower the deadweight loss is.
A76. If on a market with three producers we reduce the number of producers, the equilibrium price of the product will decrease.
A77. In a perfectly competitive market cartel agreements would be too costly.

Single choice questions

B71. Which of the following might be a barrier to entry to a market?
a) the number of competitors in the market is high.
b) the consumers' willingness to pay for the product is limited.
c) high labor costs.
d) official license or qualification is needed to operate in the industry.

B72. As the number of producers in a market increases
a) the difference between price and marginal cost goes down.
b) equilibrium price of the product decreases.
c) the industry supply function gets flatter and flatter.
d) all the above is true.

B73. The significant difference between perfect competition and oligopoly is that
a) in oligopoly the number of firms is smaller.
b) in oligopoly the product is homogenous.
c) in oligopoly the decision of one firm affects the outcome of the other firms.
d) oligopolistic firms are not profit-maximizing.

B74. In which market form do the producers have to consider what other companies in the market are doing?
a) perfect competition
b) monopoly
c) oligopoly
d) this has to be done in every markets

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B75. Economists emphasize the importance of perfect competition, because
a) it increases the number of competitors.
b) it brings down the price to the breakeven price.
c) it brings about the highest efficiency.
d) they think that is how real markets work.

B76. Why is it unlikely that a cartel agreement would prevail for long in a market, even without government intervention?
a) Because the consumers prefer competition.
b) Because the producers prefer competition.
c) Because the members expect higher profits from competing.
d) Because it is not a nash-equilibrium.

B77. Which of the following is produced on an oligopoly market?
a) Clothes.
b) Mobile carrier services in Hungary.
c) Economics BA diploma of the University of Szeged.
d) Corn.

B78. An oligopoly with 4 firms will
a) cause smaller deadweight-loss, than an oligopoly with only 3 firms.
b) produce more at a firm level than the price.
c) have the price equal the marginal cost of production.
d) have a higher industry-level profit than a monopoly.

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Solutions

A71.	True	B71.	D
A72.	True	B72.	D
A73.	False	B73.	C
A74.	True	B74.	C
A75.	True	B75.	C
A76.	False	B76.	D
A77.	True	B77.	B
		B78.	A

Explanation to True of false questions

A71. When the number of identical competitors on a market increases (ceteris paribus), the equilibrium price of the product goes down.

TRUE. Monopoly would charge the highest price, and perfect competition the lowest. In between the two extremes are the oligopolistic markets. The more competitors we have the closer we get to perfect competition in prices (and in quantity too, for that matter)

A72. With advertising companies want to make the demand for their product less price-elastic.

TRUE. With advertising companies want to make you believe that their product is not the same as another company's product. If you believe this, than you will not consider the other company's product a close substitute for theirs, and consequently they will have higher power to set the price.

A73. In an oligopolistic market the competing firms can increase their profit if they collude and keep prices high.

FALSE. Collusion is prohibited by law (anti-trust and cartel legislation). But even if it weren't, collusions and cartels have a natural tendency to break up.

A74. In oligopolistic markets it can be profitable to advertise, while in monopolistic or perfectly competitive markets it can not.

TRUE. The important thing is to be able to differentiate between producers. If there are many (infinitely many?) producers it is impossible for the consumers to tell the one apart from the other.

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A75. The higher the number of competitors in an oligopolistic market the lower the deadweight loss is.

TRUE. See question G1. Oligopoly is between monopoly (highest deadweight loss) and perfect competition (no deadweight loss). The more competitors we have, the closer we get to the perfectly competitive outcome.

A76. If on a market with three producers we reduce the number of producers, the equilibrium price of the product will decrease.

FALSE. See question G1. Now we are going in the opposite direction.

A77. In a perfectly competitive market cartel agreements would be too costly.

TRUE. In an oligopolistic market it is easy to arrange a cartel because there are not many players. In perfect competition you do not only not have to care about how much your competitors are producing, but also not whether they try to collude or not. If everybody is a very small part of the whole market, it would take enormous amount of time and money to arrange a cartel with enough many members to effectively manipulate the price.

Explanation to single choice questions

B71. Which of the following might be a barrier to entry to a market?

Barriers to entry can be anything that makes it difficult or impossible for a potential new entrant to enter a market.

a) the number of competitors in the market is high.

When lots of firm compete on a market that is an indicator of barriers to entry being low or nonexistent on that specific market.

b) the consumers' willingness to pay for the product is limited.

Consumers' willingness to pay is always limited, irrespective of market form. This would rather be a limit on the number of competitors, not a barrier to entry.

c) high labor costs.

Labor costs are variable costs that will be covered by the revenues. You might even be able to get the revenue first and pay the labor cost only after you have the money.

d) official license or qualification is needed to operate in the industry.

When you need an official license or qualification just to enter an industry, it generally deters some of the potential entrants, since it requires time and/or money to get these. Only if potential profit is big enough will new entrants take the pain of getting the license or qualification.

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B72. As the number of producers in a market increases

The question is about what difference in the outcome (price, quantity, surpluses) it makes to move from a monopoly to a duopoly, from duopoly to a market with 3 firms and so on until perfect competition.

a) the difference between price and marginal cost goes down.

This is one thing that will happen. More competitors result in smaller market share which in turn results in smaller market power. Smaller market power means a weaker opportunity to push prices above marginal cost. But even though answer a) is true you should read on.

b) equilibrium price of the product decreases.

This is also true, following from answer a). As companies set prices always nearer to the marginal cost, the price is going down.

c) the industry supply function gets flatter and flatter.

Industry supply is the horizontal sum of the individual firms' MC functions. The more functions you are summing, the flatter curve you will get.

d) all the above is true.

Since we cannot say of the answers above, that only one is true, the others are not, so this is the right answer.

B73. The significant difference between perfect competition and oligopoly is that

Try to find a difference to which you can not add: "yes, it is different, but…"

a) in oligopoly the number of firms is smaller.

The difference between "few" and "many" is very vague. Is 30 many? Is 10 few?

b) in oligopoly the product is homogenous.

Both market forms produce homogenous products, although we can have differentiated oligopoly too.

c) in oligopoly the decision of one firm affects the outcome of the other firms.

This is what brings together perfect competition and monopoly: what one firm does has no effect on other. And this is what makes a difference in the case of oligopoly: strategic interaction.

d) oligopolistic firms are not profit-maximizing.

All firms are profit maximizing independent of market forms.

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B74. In which market form do the producers have to consider what other companies in the market are doing?

In which market do you, as a producer has to watch closely what your competitors are doing? When is it worth doing, worth even spending money on it?

a) perfect competition

Your competitors are many, and any of them is just as insignificant as you are. You just need to check the price of your product and decide about the quantity you will bring to market knowing everybody else does the same and that neither you nor any of your competitors has any influence on the price.

b) monopoly

By definition you don't have competitors.

c) oligopoly

This market is defined as one where the decisions of one firm affect all the others. So you better know what your competitors are up to.

d) this has to be done in every markets

Obviously not if you are safe from competition.

B75. Economists emphasize the importance of perfect competition, because

Economists use perfect competition as a kind of measuring rod against which they measure every other market form.

a) it increases the number of competitors.

It does not increase it, at best it results in a high number of competitors. But even that in itself is neither good nor bad.

b) it brings down the price to the breakeven price.

While this is true, it is not necessarily a good thing, at least not from the point of view of the competitors.

c) it brings about the highest efficiency.

It is the market form which does not allow any further Pareto-improvement, so there is no way to reallocate resources so that nobody is hurt.

d) they think that is how real markets work.

Economists are not idealists. They do know that perfect competition does not exist, just as physicists know that frictionless world does not exist. It is just a useful abstraction.

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B76. Why is it unlikely that a cartel agreement would prevail for long in a market, even without government intervention?

Though it is illegal to enter into cartel agreements, even if it was not, economists think they would tend to break down.

a) Because the consumers prefer competition.

While it is true, it would not really bother the firms in the cartel.

b) Because the producers prefer competition.

They do not. This is why the start the cartel in the first place: acting together and not against each other can get the m greater profit.

c) Because the members expect higher profits from competing.

The same as answer b).

d) Because it is not a nash-equilibrium.

This is kind of similar to answer c). Members actually expect higher profits from defecting alone. If every OPEC country produces less oil, the price goes up. If only one country defects, and produces more, it can capture higher profits. But it would not be the only country defecting for long, and if every of them defects, the price goes down and everybody is worse off than in the beginning.

B77. Which of the following is produced on an oligopoly market?

Model assumptions of the oligopoly is, that the number of firms is small, but more than one, product can be homogenous or differentiated, and producers reacting to each other's decision have in impact on the profit of each other.

a) Clothes.

If we define the product too broadly, we will find perfect competition everywhere. Moreover, "clothes" is not even a product, you don't go to the shops buying clothes, you buy shoes, or jeans or tuxedos.

b) Mobile carrier services in Hungary.

This is a good example for oligopoly. There are currently only 3 mobile carriers in Hungary, and the alternatives (foreign mobile carriers) are usually too expensive for Hungarian citizens. It is a good question whether we consider the product itself homogenous or differentiated…

c) Economics BA diploma of the University of Szeged.

If defined narrowly, any product can be a monopolist. There is only one firm producing this good, though more producers are competing in the market Economics BA diplomas, even more in the market for BA diplomas in general. The question is how good substitutes these are.

d) Corn.

In most countries and especially in agriculturally well endowed countries corn is produced by many producers, and is quite homogenous. It is so homogenous, that you can even trade with it on the Commodities
Exchange.

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B78. An oligopoly with 4 firms will

We have a market with a number of firms between 1 and infinite. The closer it is to 1, the closer the outcome will be to the monopoly outcome, the further it is from 1, the closer the outcome will be to the perfectly competitive outcome.

a) cause smaller deadweight-loss, than an oligopoly with only 3 firms.

Deadweight loss is the welfare loss resulting from producing too little, relative to perfect competition. So DWL is zero in perfect competition, and maximum in the monopoly case. The 3 firm case is closer to monopoly, so the DWL is larger in that case.

b) produce more at a firm level than the price.

It is not a good idea to compare price and quantity, they are a totally different dimension.

c) have the price equal the marginal cost of production.

As the number of firms increase, the market power decreases and so is the ability of firms to set prices above marginal cost. This ability is zero if the number of firms is infinitely many. So with 4 firms the price will be closer to the marginal cost than with 3 firms, but not quite equal to it.

d) have a higher industry-level profit than a monopoly.

Perfect competition has the lowest industry level profit, and monopoly has the highest. So an industry with 4 firms necessarily result in a smaller industry-level profit (and also firm-level profit) than an industry with only 1 producer.

Detailed definitions with page references

(Ch 27)

Oligopoly: is an imperfectly competitive market form, in which there are only a few competitors producing a homogenous product in a market each of them facing a negatively sloped demand curve. There are barriers to entry, and since there are only a few competitors, anything that one of them does also affect the profit of the others. When the competitors decide about the quantity they will produce they have to take into account how much the other firms will likely to produce, so the firms have some market power, but also have to adapt to what the others are doing to some degree (p.497)

Collusion: is when two or more players or competitors in an oligopoly market chose not to compete with each other but rather to cooperate and set prices or quantity together.

The aim of the cooperation is to give higher profit to the parties involved. Since unfortunately this generally hurts the consumers, it is illegal (p.498)

(Ch 28)

Nash equilibrium: is a set of strategies for interdependent players in a game when none of the players has an incentive to unilaterally change his/her strategy.

If every player keeps on doing what they do now, my best response is also to continue doing what I am doing now. If nobody changes I should not change too, doing something differently than now could only hurt me (p.524)

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Short essay questions

- Explain how the market mechanism helps finding the equilibrium price of goods? (What happens, if the price is NOT the equilibrium price)
- Compare the competitive market and the perfectly price discriminating monopoly from the point of view of efficiency. Is any of them more efficient or more desirable than the other? Why?
- Use the consumer's choice model (utility, indifference curve, budget line, optimal choice etc.) to explain how it leads to increased demand for a product if the consumer starts to "like" that certain product better than before.
- What are the characteristics of well-behaved indifference curves, and what do these characteristics tell us about the preference of the consumers?
- What does elasticity of demand depend on? What makes demand more or less price-elastic, price-sensitive?
- You are the producer of Product A. There is a substitute product (B) and a complementary product (C). How would your customers react to changes in the price of product B and product C? How should you react if you want to keep your customers?
- Explain why is the average cost of production is downward sloping when there is increasing returns to scale in production.
- Explain why and how a change in a price of a resource (like wages) used in production changes the price of the final good. Suppose perfect competition prevails on all markets.
- Why is the competitive firm's supply curve upward sloping?
- Explain under what circumstances and why a perfectly competitive firm will produce in the short run even if the profit is negative and will not produce in the long run.
- Explain how a perfectly competitive industry reaches its long run equilibrium.
- Compare the monopolistic market and the perfectly competitive market from the point of view of the consumers, the producers and the society as a whole.
- Explain how price discrimination can increase the profit of a monopolist. Can it make consumers better off?

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SAMPLE FINAL EXAM ECONOMICS

Szeged, 2015.

I. Definitions (2 points each)

Define shortly the following economic concepts!

1. Price discrimination:

2. Supply curve:

3. Nash-equilibrium:

II. Short Essay (4 points)

4. What factors influence the price elasticity of demand for a product?

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III. single choice question (2 point each)

Write your choice of answer in the table on the next page. There is only one totally correct answer, though more might be partially correct. You may not change your answer in the table.

5. In the consumers' choice model, if both commodity's price decreases by the same value (measured in Forint), then the budget line
   a) is going to be parallel to the budget line before the change.
   b) is getting steeper.
   c) might become steeper of flatter.
   d) shifts farther from the origin.

6. The profit in a perfectly competitive industry is 0 in the long run because
   a) the number of competitors is high.
   b) every competitor produces exactly the same product.
   c) firms are free to enter or exit the industry.
   d) consumers are not willing to pay more for the product than its marginal cost of production.

7. Economists like perfect competition, because
   a) everybody who needs the product can get it.
   b) no other market form could generate more profit to the producers.
   c) it is Pareto-efficient.
   d) it is realistic.

8. The alternative cost of getting one unit of Commodity 1 is 5 units of Commodity 2. This means, that
   a) $MU_1 = 5$
   b) $MRS = 5$
   c) $U = x_1 + 5 \cdot x_2$
   d) $p_1/p_2 = 5$.

9. A producer finds, that the demand for its product is price-inelastic. The producer can increase revenue if he/she
   a) increases the price.
   b) decreases the price.
   c) decreases the quantity sold.
   d) changes the consumers' preferences

10. For the current quantity of labor used by the company we know that $w/P < MPL$. In this case, the company should
   a) increase the price of its product.
   b) use more workers.
   c) decrease production.
   d) decrease the price of labor used.

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11. Suppose that in a market, the supply of a good increases. After the increase, in the new equilibrium
    a) both the price and the quantity will be higher than originally.
    b) both the price and the quantity will be lower than originally.
    c) the price will be higher, but the quantity will be lower than originally.
    d) the price will be lower, but the quantity will be higher than originally.

12. The monopolist's profit maximizing price will be higher than
    a) the consumers' reservation price.
    b) average cost of production.
    c) marginal cost of production.
    d) marginal rate of substitution.

13. The significant difference between perfect competition and oligopoly is that
    a) in oligopoly the decision of one firm affects the outcome of the other firms.
    b) in oligopoly the product is homogenous.
    c) oligopolistic firms are not profit-maximizing.
    d) in oligopoly the number of firms is smaller.

14. You are a monopolist and are able to do price differentiation between market A where demand is price-elastic and market B where it is price in-elastic. What should you do?
    a) use uniform pricing.
    b) produce only for the price-inelastic market.
    c) use a higher price on market A and a lower price on market B.
    d) use a lower price on market A and a higher price on market B.

IV. True or False question (1 point each)

Write your answers ("true" or "false") in the table below. You may not change your answer there.

15. If the price of a factor of production increases, the production function shifts to the left.

16. The marginal rate of substitution can be calculated as p_1/p_2.

17. A producer will always produce that quantity for which average cost is the lowest.

18. For a perfectly competitive company, increasing production always increases revenue.

19. If the utility function is $U = x_1^2 \cdot x_2^4$ and commodity 2 is twice as expensive as commodity 1, the consumer will buy the same quantity of the two commodities.

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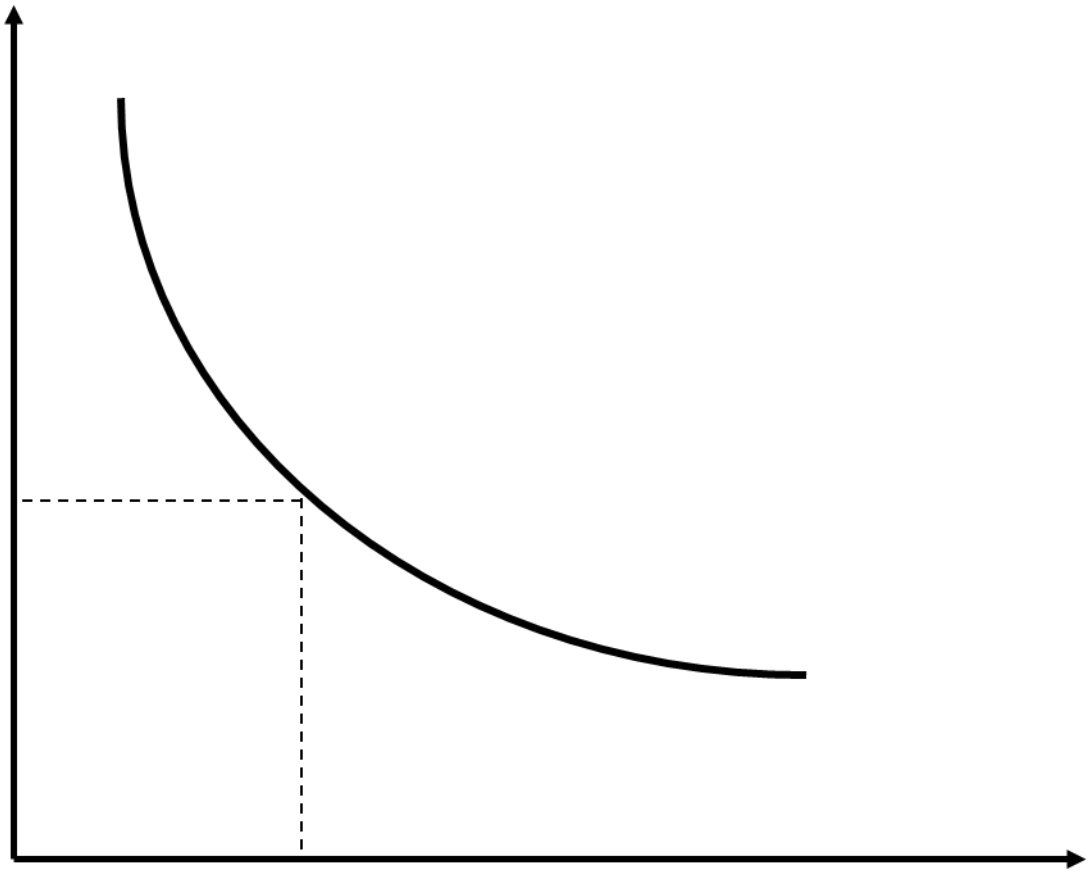
V. Geometrical Exercise (6 points)

20. On the graph below is an indifference curve.
Label the axes (1 point).
Draw a budget line so that the optimal bundle is on this specific indifference curve! Mark the optimal bundle! (2 points)
What happens on the graph, if the price of one of the commodities decreases? (2 points)
Show on the graph, that the consumer can reach higher utility with the lower price (1 point)



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Sample Final Exam Key

1-3. See definition list.

4. We are thinking about why the consumers would be more or less sensitive to changes in the price. It can partly depend on the product: demand for products which are “important” to the consumers is in-elastic. A product can be either important for a consumer because he/she can not easily substitute it (like a specific medicine) or because he/she do not want to substitute it (our consumer is a devout Coca Cola fan, would not buy Pepsi). It can depend also on the consumer: on his/her preferences or his/her income (generally those with higher income are less sensitive to changes in the price). Other factors can include the absolute magnitude of the price (I don’t really care how the price of matches changes, since it represents a very small part of my income), how well-informed the consumer is (for products I don’t buy regularly I may not even notice the price change, so it does not affect me much), and the time allowed to adjust (if there is just a little time to adjust, I will be less sensitive to price changes than if I have lot of time to adjust and find substitutes).

5.	C	a variation of B21, with decreasing prices. Also the answers are in different order.
6.	C	variation of B21 with answer d) changed.
7.	C	see B25.
8.	D	Same as B24, with 5 instead of 4.
9.	A	Variation of B34, with INelastic demand.
10.	B	Variation of B44.
11.	D	Variation of B12 with a supply change.
12.	C	See B63.
13.	A	Same as B73, different order of answers.
14.	D	New question

15.	False	A41
16.	False	A22
17.	False	A43
18.	True	A52
19.	True	New question

20.

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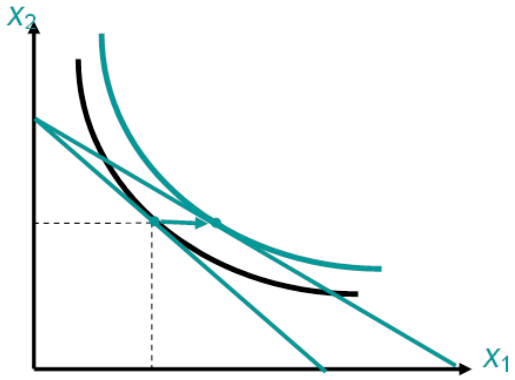

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