

Seminar 10.

Task 1. Subsistence level is 200 USD, individual's attitude to work 0.5, salary 25 USD/hr, limit of physical capabilities 14 h/day, personal income tax 30%. Determine the optimal labor activity of the individual and his well-being when he receives 100 USD and 300 USD as rental income.

Task 2. The salary per unit of work is 45 thousand USD, fill in the table and make a conclusion, how many employees the company need to hire.

Number of employees	Issue volume	Marginal product of labor	Unit price	Marginal product of labor in monetary terms
0	0		3000	
1	10		3000	
2	25		3000	
3	34		3000	
4	40		3000	
5	44		3000	

Task 3. There is a certain machine that will be used for 3 years, bringing an annual income of 2000 USD. Its residual value by the end of the third year will be 6000 USD. Determine the price of the machine, fully covering costs, if:

- a) The interest rate is 8%?
- b) The interest rate is 10%?
- c) The interest rate is 8%, but the expected inflation will be 7% per year?

Task 4. Demand for labor and its supply are determined by the formulas: $L_d = 100 - 20W$ and $L_s = -60 + 80W$ respectively. Find the level of forced unemployment, if the minimum wage is set at 2 coins in 1 year. How will the total income of employees change after the minimum wage is set?

Task 5 . The firm is the perfect competitor in the market of finished goods. Its production function in the short term is written by the formula $Q = 200L^{0.5}$, where L is number of employees. The price of finished goods 3 coins. Units, and the level of wages - 30 coins (labor market is competitive). Determine how many employees the firm will hire if it maximizes its profits.

Task 6. In the short term, the production function of the firm, which is a perfect competitor in the market of finished products $Q = 12L - L^2$; $0 \leq L \leq 6$, where L - amount of labor used (employees / day), and Q - output per day. The price for the company's products is 1 coin per unit. The labor market is competitive. Determine how many employees will be hired at the rate of 4 coins/day.

Task 7 . Suppose that the only income of an employee in the firm is a salary. The utility function of the employee has the form: $U = I \cdot H$, where I - his income, and H - number of hours of rest per day. Determine the daily job offer by the employee (in hours).

Task 8. The administration of the cafe "Micro & Macro" has announced the recruitment of waiters. Demand is described by the equation $L = 10 - 0.2w$, where L - the number of employees w - hourly wages. 7 people expressed a desire to work in a cafe: 2 are ready to work with a salary of at least 40 coins/hr, 2 - not less than 25 coins/hr, 2 - not less than 20 coins/hr, one is ready to work for 15 coins/hr.

a) How many waiters will hire a cafe and at what salary? Illustrate the answer graphically.

b) The state set the minimum wage at coins/hr. How many waiters will the cafe hire now?

Task 9 . The production function of a firm operating in a competitive market has the form

$$Q = 500L^{\frac{1}{2}}. \text{ The unit price is 2 coins.}$$

a) How many employees will the company hire if the hourly wage is 100 coins?
Compose the demand function for labor

b) If the salary is 100 coins/h, then how many products will the company produce at a price of 1 coin. Compose the supply function of the firm.

Problem 10. The consumer utility function is written by the formula $U(b, y) = b - (10 - y)^2$, where b - the level of income per day y - time that can be used in any way ($y \leq 16$).

a) Compose the function of individual labor supply.

b) At what level of wages the employee will completely give up free time, what income will he receive?

c) How many hours will the worker work without receiving any reward, what will be his utility?

Task 11. A firm operating in a competitive global market is a monopolist in the labour market (monopsony). The production function of the firm is $Q(L) = 300L - L^2$, the function of labour supply – $L_s = 2w - 160$. The price of finished products is 0.5 coins. Determine wages, the number of workers, and output in the market.

Task 12. Demand and supply function in the skilled labour market $L_D = 16000 - 500w$, $L_s = -10000 + 800w$. A company that hires workers is a monopolist in the labour market and sells products in a competitive market.

a) Determine the number of employees hired by the firm and their wage rate.

b) Determine the number of employees that the firm will hire and the wage rate if the employees unite into a trade union that will act in the labour market as a monopolist.

Task 13. Determine the optimal wage rate for an employee with 10 years of experience according to the Shapiro -Stiglitz model, if the market wage is 3500 coins, the cost of monitoring in the firm is expressed by the formula $M(p) = 2p^2 + p + 11$, and each period the worker has the opportunity to appropriate 1700 coins.