

Economics and Econometrics: Second-round Sample Tasks for the Open Doors Bachelor's Track

This sample test comprises 30 tasks, including 19 entry-level tasks with a single correct answer (each correct answer is assigned 2 points), 8 intermediate-level tasks with multiple correct answers (the correct answer is assigned 4 points), 3 advanced-level tasks requiring a detailed answer (the answer is assigned 10 points depending on its correctness and completeness).

For advanced-level tasks requiring a detailed answer, assessment criteria and a standard answer are provided.

Field of Science 1. Finance

Task 1 Entry level (2 points)

Select a type of exchange rate that does not exist:

- a. cross rate
- b. reverse quote
- c. fixed exchange rate
- d. **monetary exchange rate**

Answer: d.

Task 2 Entry level (2 points)

Choose a combination which provides a controlling interest in the stock

- a. **50 % plus a share**
- b. 50% plus 1 per cent
- c. 50% minus a share
- d. 49% plus 1%

Answer: a.

Task 3 Entry level (2 points)

The Central Bank has increased the discount rate, as a result you can expect

- a. **a decrease in the money supply**
- b. an increase in the money supply
- c. a fall in interest rates
- d. an increase of loans issued
- e. rapid GDP growth

Answer: a.

Task 4
Entry level (2 points)

Monetary policy instruments are:

- a. tax rates
- b. required reserve ratio**
- c. government purchases
- d. social transfers

Answer: b.

Task 5
Intermediate level (4 points)

Choose 2 pairs of options that illustrate the principles of economic rationality of market agents, if a bank offers the following options for the terms of a 4-year transaction

- a. **a loan at a simple rate of 5% p.a., a deposit at a simple rate of 5% p.a.**
- b. a loan at a compound rate of 5% p.a., a deposit at a simple rate of 5% p.a.
- c. a loan at a simple rate of 5% p.a., a deposit at a simple rate of 5% p.a.
- d. a loan at a simple rate of 5% per month, a deposit at a compound rate of 5% per month**

Answer: a, d.

Task 6
Intermediate level (4 points)

In country X, there is a decline in GDP and a slowdown in industrial production. What fiscal policy measures should the government undertake to stimulate the economy?

- a. reduce government spending
- b. reduce taxes**
- c. increase taxes
- d. increase government spending**

Answer: b, d.

Field of Science 2. Economic Theory

Task 7
Entry level (2 points)

In the long-run study period, in a perfectly competitive market, the price is set

- a. at the point of maximum gross revenue
- b. at the point of minimum average costs**
- c. at the point of minimum average variable costs
- d. at the point of minimum marginal costs

Answer: b.

Task 8
Entry level (2 points)

If a businessman endeavours to purchase expensive goods (yachts, helicopters and islands in the Pacific) to demonstrate his wealth, this is the example of:

- a. **the Veblen effect**
- b. the Giffen effect
- c. the majority effect
- d. the snob effect

Answer: a.

Task 9
Entry level (2 points)

Economic growth in different countries is measured by the following indicator:

- a. Nominal Gross Domestic Product
- b. Value of the consumer basket
- c. **Real Gross Domestic Product**
- d. Number of employed population

Answer: c.

Task 10
Intermediate level (4 points)

Select the characteristic features of a market for monopolistic competition:

- a. **differentiated products**
- b. homogeneous products
- c. **high advertising costs**
- d. one producer in the industry

Answer: a, c.

Task 11
Intermediate level (4 points)

Select possible "failures" (imperfections) of the market in the economy:

- a. **production of public goods**
- b. shortage of goods and services
- c. insufficient assortment of goods
- d. **anti-monopoly policy**

Answer: a, d.

Task 12

Advanced level (10 points)

Demand and supply functions on the ice-cream market in a certain region are given as:
 $Q_d = 80 - 5P$, $Q_s = -40 + 10P$, where the price is in dollars and the quantity is in pieces.

Task:

- 1) determine the parameters of equilibrium in the market for this product: equilibrium price and equilibrium volume.
- 2) determine at what maximum price consumers are willing to buy ice cream and at what minimum price producers are willing to supply the product to the market.
- 3) The producers have decided to increase the price by \$2 above the equilibrium. What will happen in this situation in the market and in what magnitude?

Note: A complete solution must include your method and reasoning. Providing the final answer alone will not suffice.

Solution:

1) $80 - 5P = -40 + 10P$

$120 = 15P$

$P_e = 8$ dollars

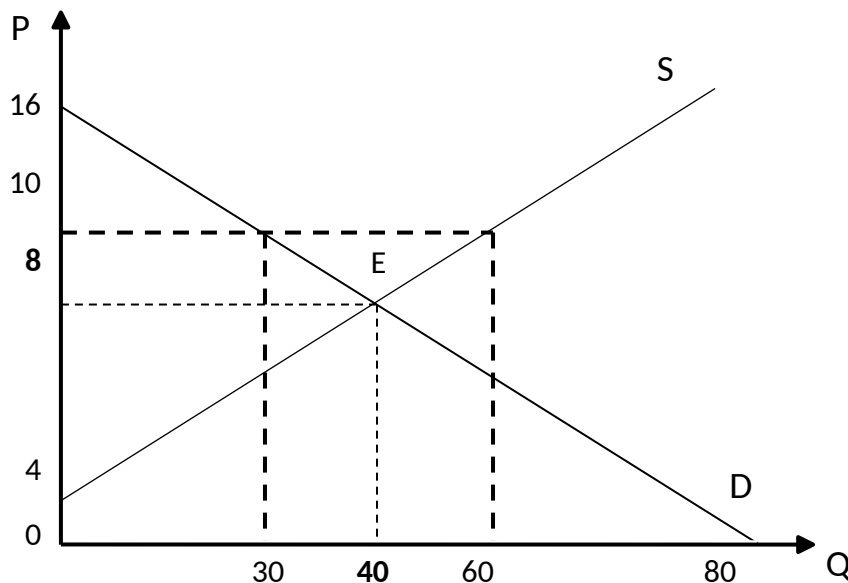
$Q_e = 80 - 5 \cdot 8 = 40$ pcs.

2) The buyer has $P_{mah} = \$16$ ($0 = 80 - 5P$, hence $P = 16$)

At the producer $P_{min} = 4$ dollars ($0 = -40 + 4P$, hence $P = 4$)

3) $P_2 = 8 + 2 = 10$ dollars. There will be a surplus of goods in the market as

$Q_d = 80 - 5 \cdot 10 = 30$ pc, $Q_s = -40 + 10 \cdot 10 = 60$ pc. Surplus of goods = $60 - 30 = 30$ pcs.



Answer: 1) $P_e = 8$, $Q_e = 40$, 2) $P_{mah} = 16$, $P_{min} = 4$. 3) Surplus of goods = 30 pcs.

Assessment criteria:

Criterion 1 – one question is answered correctly – 1 point.

Criterion 2 – a correct solution is given for one question with minor flaws or inaccuracies that do not distort the cause-and-effect relationships necessary to explain the solution process - 2 points.

Criterion 3 – the correct solutions and correct answers to 3 questions are given – 1 point.

Field of Science 3. Regional and Sectoral Economics

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Task 13
Entry level (2 points)

The consolidation into a single complex by merger or acquisition of several enterprises within the same industry that produce identical goods or services is called:

- a. **horizontal integration**
- b. agglomeration
- c. industrial node
- d. vertical integration

Answer: a.

Task 14
Entry level (2 points)

Indicate which of the following industries belong to the chemical industry

- a. **Production of mineral fertilisers**
- b. Oil extraction
- c. Gas
- d. Coal

Answer: a.

Task 15
Entry level (2 points)

The government is deciding in which region to place a State Nature Reserve. Which factor is likely to have a significant impact on the location of this facility in a particular region?

- a. availability of raw materials
- b. fuel availability
- c. availability of energy
- d. significant workforce
- e. a large number of consumers
- f. transport hubs and roads
- g. **the need to protect the environment**

Answer: g.

Task 16
Entry level (2 points)

The region is a/an

- a. **socio-economic system**
- b. economic system
- c. socio-ecological system
- d. socio-political system

Answer: a.

Task 17
Intermediate level (4 points)

Select the causes of uneven economic and social development of regions:

- a. concentrated electricity production in certain regions of the country**
- b. high entry barriers to enter the industry
- c. developed interregional transport infrastructure
- d. inflexible budget and tax policy**

Answer: a, d.

Field of Science 4. World Economy

Task 18
Entry level (2 points)

The factors influencing the economic backwardness of countries in the global economy do not include

- a. backwardness of the production base
- b. inefficiency in the use of labor
- c. inefficiency of public administration
- d. the emergence of pandemics**

Answer: d.

Task 19
Entry level (2 points)

The international division of labor cannot be based on:

- a. natural resources and geographical location
- b. the desires and demands of the government**
- c. particular features of culture and religion
- d. the level of scientific development and technology

Answer: b.

Task 20
Entry level (2 points)

A positive trade balance has a direct positive effect in calculating one of the following:

- a. unemployment rate
- b. volume of foreign investment
- c. gross domestic product**
- d. inflation rate

Answer: c.

Task 21
Intermediate level (4 points)

Tariff methods include (choose 2 possible answers)

- a. **ad valorem duty**
- b. quota
- c. **specific duty**
- d. value added tax

Answer: a, c.

Task 22
Intermediate level (4 points)

The production capabilities of two countries for two goods (candy and cookies) are given in thousands of tons per year. Which country has a relative (comparative) advantage in the production of candy and should specialize in its production?

In your answer, specify the country that specializes in production and the value of the alternative cost.

	USA	China
Candy	1680	320
Cookies	2340	200

- a. **China**
- b. USA
- c. **0,625**
- d. 0,718
- e. 1,393
- f. 0,575

Answer: Answer a, Answer c.

Comment: China has a comparative advantage in the production of candy, because it has a lower alternative cost ($200/320=0.625$) in comparison with the United States)

Task 23
Advanced level (10 points)

The functions of supply and demand in the grain market for two countries (Country A and Country B) are given:

$$Q_{dA}=600-2P, Q_{sA}=-300+4P$$

$$Q_{dB}=200-P, Q_{sB}=-200+3P$$

The price is in dollars and the quantity is in tons.

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Tasks:

- 1) Find the parameters of equilibrium in the market of this product in each of the countries if the economy is closed and there is no foreign trade: specify the equilibrium price and the equilibrium volume for each country.
- 2) Find the equilibrium parameters if there is a global grain market represented solely by these two countries: calculate the world price and sales volume on the world market.
- 3) Calculate the volume of grain that will be sold/bought on the world market.

Note: A complete solution must include your method and reasoning. Providing the final answer alone will not suffice.

Solution:

1) Country A – equilibrium price and equilibrium volume

$$600 - 2P = -300 + 4P$$

$$P = 150$$

$$Q = 300$$

Country B – equilibrium price and equilibrium volume

$$200 - P = -200 + 3P$$

$$P = 100$$

$$Q = 100$$

2) World price and sales volume on the world market

$$Q_{dA} + Q_{dB} = Q_{sA} + Q_{sB}$$

$$600 - 2P + 200 - P = -300 + 4P + (-200 + 3P)$$

$$P_{\text{world}} = 130$$

$$Q_{\text{world}} = 410$$

3) the volume of grain that will be sold/bought on the world market

$$Q_d = 600 - 2 \cdot 130 = 340$$

$$Q_s = -300 + 4 \cdot 130 = 220$$

$$Q_d - Q_s = 340 - 220 = 120$$

Answer: 1) $P_A = 150$ dollars, $Q_A = 300$ tons, $P_B = 100$ dollars, $Q_B = 100$ tons

2) $P_{\text{world}} = 130$ dollars, $Q_{\text{world}} = 410$ tons.

3) the volume of grain that will be sold/ bought on the world market = 120 tons.

Assessment criteria:

Criterion 1 – one question is answered correctly – 1 point.

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Field of Science 5. Mathematical, Statistical and Instrumental Methods in Economics

Task 24 Entry level (2 points)

An indicator that characterises a measure of the feasibility of certain events is

- a. probability
- b. significance

- c. completeness
- d. dispersion

Answer: a.

Task 25
Entry level (2 points)

Misha wants to buy shares. The probability of buying a share with a yield of more than 10% is 0.8, with a yield of more than 20% is 0.5. What is the probability of Misha buying shares with a yield between 10% and 20%, provided that all shares available for purchase are yielding.

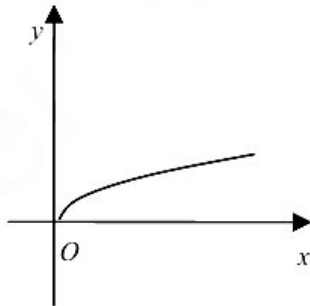
- a. 0,2
- b. 0,1
- c. **0,3**
- d. 0,5

Answer: a.

Comment: $0,8 = P(10-20\%) + 0,5$; $P(A) = 0,3$

Task 26
Entry level (2 points)

Profit of the firm (y) depends on the amount of costs (x) and is represented in the figure. Which analytical form of writing down the function is best suited to describe the dependence in the figure?



- a. $y = kx + b$
- b. $y = x^2$
- c. **$y = \sqrt[2]{x}$**
- d. $y = x^3$

Answer: c.

Task 27
Entry level (2 points)

The entire population of a country is divided into the able-bodied and the non-able-bodied. Some of the able-bodied population are those who have dropped out of the labour force, while the remainder are the employed and unemployed. The table shows the data on the population of the country "Alpha".

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Indicator	Number, thousands of people
Population of the country	2 000 000
Non-able-bodied	200 000
Dropped out of the labour force	100 000
Employed	1 400 000
Pensioners	40 000
Schoolchildren	20 000
Housewives	10 000

Using the data in the table, calculate the number of unemployed people in the country "Alpha".

- a. 230 000
- b. 300 000**
- c. 400 000
- d. 70 000

Answer: b.

Comment: $2,000,000 - 100,000 - 1,400,000 - 200,000 = 300,000$ people

Task 28 Entry level (2 points)

Milk is sold in bottles of 2 liters and 3 liters each. The price of a 2-liter bottle is 60 roubles, and the price of a 3-liter bottle is 80 roubles. How much can Masha save if she buys 6 liters of milk in 3-liter bottles instead of 2-liter bottles?

- a. 20 roubles**
- b. 30 roubles
- c. 10 roubles
- d. 18 roubles

Answer: a.

Comment: $2 \cdot 80 - 3 \cdot 60 =$ roubles

Task 29 Intermediate level (4 points)

Masha likes chocolate and Petya likes ice cream. Masha bought several bars of chocolate, and Petya bought 5 portions of ice cream. Chocolate costs 100 roubles, ice cream costs 50 roubles. Based on the problem condition, choose the correct statement:

- a. if the total expenditure is 750 roubles, Petya and Masha buy the same amount of chocolate and ice cream
- b. if Masha buys 4 portions of chocolate, then the total expenses for buying sweets will amount to 650 roubles**
- c. If Masha's budget is 200 roubles and Petya's is 400 roubles, then Masha buys more chocolate than Petya buys ice-cream.

d. Petya and Masha can buy the same number of servings of sweets if the budget is 1200 roubles

Answer: b, d.

Task 30
Advanced level (10 points)

The "Orange" farm grows oranges. The farm is one of many orange producers in the country, each of which cannot influence the market. The market price of 1 kg of oranges is 125 roubles. The farm's cost function is $TC = Q^3 + 50Q + 100$, where Q is the quantity of kilograms of oranges.

Tasks:

- 1) Calculate the value of marginal cost when growing 10 kg of oranges.
- 2) Calculate the optimal profit from selling oranges.
- 3) Find the change in profit from selling oranges if the government introduces a tax of 100 rubles for the right to produce oranges.

Note: A complete solution must include your method and reasoning. Providing the final answer alone will not suffice.

Solution:

$$\begin{aligned}
 1) \quad MC &= (TC)' = 3Q^2 + 50 \\
 MC(Q=10) &= 3 \cdot 100 + 50 = 350 \text{ roubles.} \\
 2) \quad \pi &= TR - TC \text{ при } MC=P - \text{perfect competition} \\
 3Q^2 + 50 &= 125, \\
 Q &= 5 \text{ кг} \\
 TC(Q=5) &= 5^3 + 50 \cdot 5 + 100 = 425 \text{ roubles.} \\
 TR(Q=5) &= 125 \cdot 5 = 625 \text{ roubles.} \\
 \pi &= 625 - 425 = 200 \text{ roubles.} \\
 3) \quad TC^* &= Q^3 + 50Q + 100 + 100 = Q^3 + 50Q + 200 \\
 MC &= (TC)' = 3Q^2 + 50 \\
 Q^2 + 50 &= 125, \\
 Q &= 5 \text{ кг} \\
 TC(Q=5) &= 5^3 + 50 \cdot 5 + 200 = 525 \text{ roubles.} \\
 TR(Q=5) &= 125 \cdot 5 = 625 \text{ roubles.} \\
 \pi &= 625 - 525 = 100 \text{ roubles.} \\
 \Delta\pi &= 200 - 100 = 100 \text{ roubles.}
 \end{aligned}$$

Answer: 1) 120 roubles 2) 8 portions 3) increased by 200 roubles.

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