

HOME TASK
**on «International logistics and
process management»**

Group: _____

Student: _____

Lector: _____

Estimate: _____

Homework consists of a theoretical and practical part.

Theoretical part

According to the number on the list, select the theme of the theoretical part. The volume of the theoretical part of 7-15 pages.

№	Theoretical question
1.	The main purpose, task and function of international logistics.
2.	The role of logistics system in the international economics relationship
3.	International logistics in the international suppliers
4.	Logistics approach to the of management material flows in the sphere of production
5.	Features of creating an international system for the distribution of products
6.	Design and development of inventory management systems
7.	Formation and functioning of international logistics centre
8.	Transport support of international logistics
9.	Logistics approach to the customer services
10.	Role the logistics centers in the international supply chain
11.	Information systems in the international supply chain
12.	The role of globalization processes in international logistics
13.	The role of politics and economics in the international logistics
14.	The main purpose, task and function of international logistics.
15.	The role of logistics system in the international economics relationship
16.	International logistics in the international suppliers
17.	Logistics approach to the of management material flows in the sphere of production
18.	Features of creating an international system for the distribution of products
19.	Design and development of inventory management systems
20.	Formation and functioning of international logistics centre
21.	Transport support of international logistics
22.	Logistics approach to the customer services
23.	Role the logistics centers in the international supply chain
24.	Information systems in the international supply chain
25.	The role of globalization processes in international logistics
26.	The role of politics and economics in the international logistics

Practical part

TASK 1. The method of supplier selection based on rating

You have to evaluate five suppliers and make decision about choosing the best one. Use the method of supplier selection based on rating. Justify your answer.

№	Criteria	Suppliers					Rank
		1	2	3	4	5	
1							
2							
...							
...							
...							
K							

Where $K = 10 + i$.

i – the last numeral of the credit book

Methodical recommendations for the performance of work

This method relates to Multicriteria decision group. On the first step we set a list of criteria from the next groups:

- 1) relay – give the answer “yes” or “no” (for example certificate availability);
- 2) quantitative;
- 3) qualitative.

Primarily check the relay criteria and exclude that suppliers who have answer “no”.

On the second step we calculate weight of quantitative and qualitative criteria by the following formula:

$$W_i = \frac{2(K - r + 1)}{K(K + 1)},$$

where W_i – weight of criteria i , $i \in \overline{1, K}$;

K – total amount of criteria (except relay criteria);

r – rank of criteria i (the smallest value belongs to the most important criteria, the biggest value- to the least important criteria);

Then we define the extremum of criteria (max or min) and find out this value iterating through all suppliers.

Calculate quantitative criteria by the following formula:

- when extremum “max”

$$Z_j = \frac{K_{actualj}}{K_{reference}},$$

- when extremum “min”

$$Z_j = \frac{K_{reference}}{K_{actualj}}, \quad j \in \overline{1, m}, m - \text{amount of suppliers}$$

where $K_{reference}$ - reference value of criteria, **контрольне значення критеріїв**

$K_{actualj}$ - actual value of supplier j by criteria. **фактична вартість постачальника j за критеріями.**

The weighted value is calculated as: **Зважене значення розраховується як:**

$$D_i = Z_i \cdot W_i$$

The qualitative criteria is calculated with help of scale

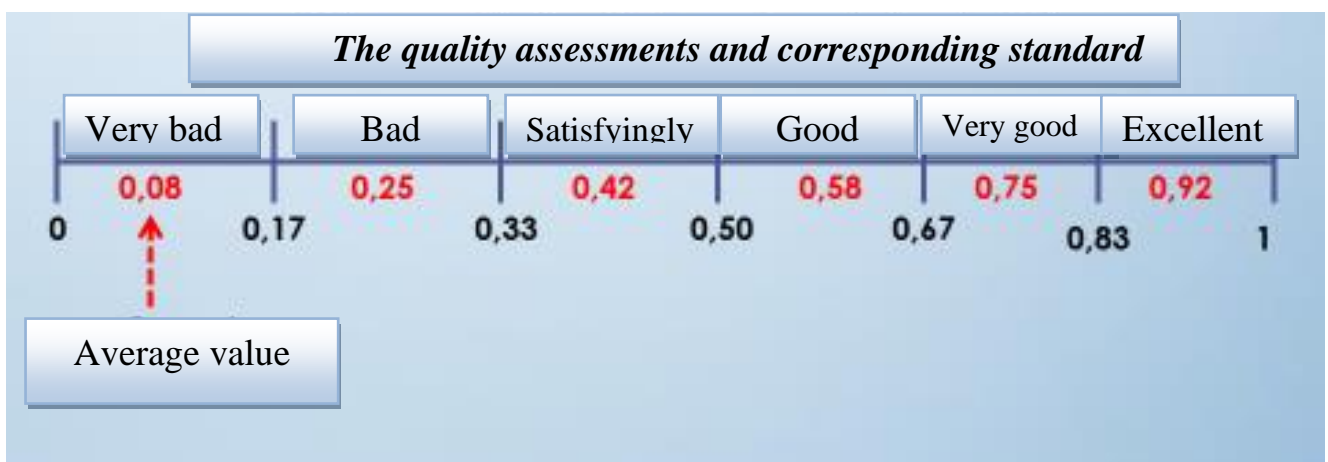
Table 1

The quality assessments and corresponding standard assessments

Quality assessment	Corresponding standard assessment
Excellent	0,92
Very good	0,75
Good	0,58
Satisfyingly	0,42
Bad	0,25
Very bad	0,08

The rating is sum of weighted value of quantitative and qualitative criteria.

First of all, we select quality assessment for example, 7 assessments. Than we chose the maximum value, in our case it is 1. After that we should divide 1 to 7 (equal to 0,17) and find interval of each assessment. Than we can chose the average value of each interval.



TASK 2. International Transportation and batch optimization

Output data.

Construct a graph that shows the changes of the international transportation. Determine the average time of resources during the transportation, the average inventory and average daily shipments of resources. Input data are given in Table 1. Make the optimization of batch using the Gantt chart.

Table 1 - Graph of changes in transport inventory (Period (P) – 40 days)

Number of shipment	Date of shipping January	Quantity (batch), t Q	Period of transportation, days t
1	1	45-i	7
2	3	5+i	14-i
3	7	15+i	10
4	12	25	8
5	13	10+i	15
6	18	15+i	6
7	20	35-i	7
8	22	40-i	3
9	24	25	1+i
10	30	60-i	5

Where i – the last numeral of the credit book

j – the previous numeral of the credit book

TASK 3. “Determine the variant of storage and transportation of goods”

Determine variant of storage and transportation of goods ($n = 7, 6, 5, 4, 3, 2$) which has the minimum total costs. Create the graphs of the Volume of products from the manufacturer and Volume of products from the intermediary for each variant of number of orders. The bench mark data is given in the table.

Table 1– The bench mark data for calculating

Criteria	Dimension	Value
Daily demand of goods for intermediary	ton/day	$5 + 0,1*i$
Storage cost of 1 product per day from the manufacturer	uah per day/ton	$25 + i$
Storage cost of 1 product per day from the intermediary	uah per day/ton	$5 + 0,1*i$
Cost to place a single	uah	$50 + i$

order		
Fuel cost of 1 liter	uah\liter	18
Transportation tariff per 1 ton	uah\ton	$1+0,1*i$
The volume of fuel that is consumed during transportation	liters	$10+j$

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TASK 4. Theme «ABC/XYZ analyses of inventory control»

The company sells mass commodity. The head of the company decided to expand the trading range of products, which should lead to an increase competitiveness and strengthen position of the company in the market. However, the free financial resources, as well as storage space is not enough.

For the logistics department is necessary to review methods of inventory control for the possibility of minimizing the storage space, as well as cash which is in unnecessary things. Input data us given in table 1.

Task:

1. Perform ABC - analysis of the goods, taking into account the share of inventory for each item in the total volume of inventory. Construct the graph of ABC - analysis. Write the conclusions about results.
2. Perform XYZ- analysis. Construct the graph of XYZ - analysis. Write the conclusions about results.
3. Create matrix of ABC/ XYZ methods. Explain the results.
4. Describe proposition about inventory control (Determine which stocks of items should most closely be monitored).

Table 1. Input data for ABC/XYZ analyses

№ позиції	Середній квартальний запас за позицією	Реалізація за квартал			
		1 квартал	2 квартал	3 квартал	4 квартал
1	$500+40j$	$120+10j$	$124+10j$	$140+10j$	$136+10j$
2	$152+40j$	$48+10j$	$36+10j$	$44+10j$	$32+10j$
3	$600+40j$	$100+10j$	$280+10j$	$80+10j$	$140+10j$
4	$112+40j$	$28+10j$	$30+10j$	$34+10j$	$28+10j$
5	$22+40j$	$2+10j$	$0+10j$	$12+10j$	$10+10j$
6	$376+40j$	$104+10j$	$106+10j$	$80+10j$	$86+10j$
7	$38+40j$	$8+10j$	$8+10j$	$10+10j$	$14+10j$
8	$3410+40j$	$900+10j$	$920+10j$	$880+10j$	$860+10j$
9	$54+40j$	$8+10j$	$12+10j$	$20+10j$	$8+10j$
10	$800+40j$	$202+10j$	$206+10j$	$210+10j$	$190+10j$
11	$1800+40(j+i)$	$448+10(j+i)$	$440+10(j+i)$	$460+10(j+i)$	$452+10(j+i)$
12	$450+40(j+i)$	$106+10(j+i)$	$112+10(j+i)$	$108+10(j+i)$	$114+10(j+i)$
13	$196+40(j+i)$	$46+10(j+i)$	$52+10(j+i)$	$54+10(j+i)$	$48+10(j+i)$
14	$68+40(j+i)$	$20+10(j+i)$	$12+10(j+i)$	$14+10(j+i)$	$10+10(j+i)$
15	$62+40(j+i)$	$16+10(j+i)$	$20+10(j+i)$	$16+10(j+i)$	$12+10(j+i)$
16	$48+40(j+i)$	$12+10(j+i)$	$16+10(j+i)$	$18+10(j+i)$	$10+10(j+i)$

17	$34+40(j+i)$	$6+10(j+i)$	$10+10(j+i)$	$8+10(j+i)$	$8+10(j+i)$
18	$24+40(j+i)$	$4+10(j+i)$	$6+10(j+i)$	$2+10(j+i)$	$12+10(j+i)$
19	$92+40(j+i)$	$40+10(j+i)$	$20+10(j+i)$	$24+10(j+i)$	$12+10(j+i)$
20	$14+40(j+i)$	$4+10(j+i)$	$0+10(j+i)$	$4+10(j+i)$	$8+10(j+i)$
21	$44+40(j+i)$	$10+10(j+i)$	$8+10(j+i)$	$8+10(j+i)$	$14+10(j+i)$
22	$136+40(j+i)$	$40+10(j+i)$	$38+10(j+i)$	$38+10(j+i)$	$36+10(j+i)$
23	$4+40(j+i)$	$0+10(j+i)$	$1+10(j+i)$	$1+10(j+i)$	$6+10(j+i)$
24	$36+40(j+i)$	$8+10(j+i)$	$10+10(j+i)$	$8+10(j+i)$	$14+10(j+i)$
25	$478+40(j+i)$	$142+10(j+i)$	$134+10(j+i)$	$160+10(j+i)$	$116+10(j+i)$
26	$26+40(j+i)$	$6+10(j+i)$	$10+10(j+i)$	$8+10(j+i)$	$8+10(j+i)$
27	$4680+40(j+i)$	$1056+10(j+i)$	$1120+10(j+i)$	$1120+10(j+i)$	$1200+10(j+i)$
28	$8+40(j+i)$	$2+10(j+i)$	$4+10(j+i)$	$2+10(j+i)$	$0+10(j+i)$
29	$42+40(j+i)$	$10+10(j+i)$	$14+10(j+i)$	$6+10(j+i)$	$10+10(j+i)$
30	$224+40(j+i)$	$60+10(j+i)$	$80+10(j+i)$	$40+10(j+i)$	$40+10(j+i)$
31	$6+40i$	$2+10i$	$2+10i$	$3+10i$	$1+10i$
32	$16+40i$	$0+10i$	$4+10i$	$4+10i$	$16+10i$
33	$64+40i$	$14+10i$	$10+10i$	$16+10i$	$8+10i$
34	$2720+40i$	$580+10i$	$632+10i$	$640+10i$	$660+10i$
35	$88+40i$	$20+10i$	$28+10i$	$36+10i$	$28+10i$
36	$12+40i$	$2+10i$	$6+10i$	$6+10i$	$2+10i$
37	$72+40i$	$16+10i$	$20+10i$	$18+10i$	$18+10i$
38	$1080+40i$	$352+10i$	$160+10i$	$112+10i$	$456+10i$
39	$28+40i$	$2+10i$	$6+10i$	$16+10i$	$8+10i$
40	$2210+10i$	$500+10j$	520	540	488
41	$70+10j$	$16+10j$	18	$18+10i$	$12+10j$
42	$256+10j$	64	$68+10j$	60	64
43	332	112	116	$76+10j$	$56+10i$
44	$80+10j$	$20+10i$	22	20	18
45	100	24	$28+10i$	$26+10j+10j$	34
46	176	$46+10j$	46	40	$28+10j$
47	$420+10i$	108	120	$88+10i$	100
48	$10+10j$	$4+10j$	$4+10j$	6	$2+10j$
49	1450	300	440	340	360
50	280	$60+10i$	70	$72+10j$	78

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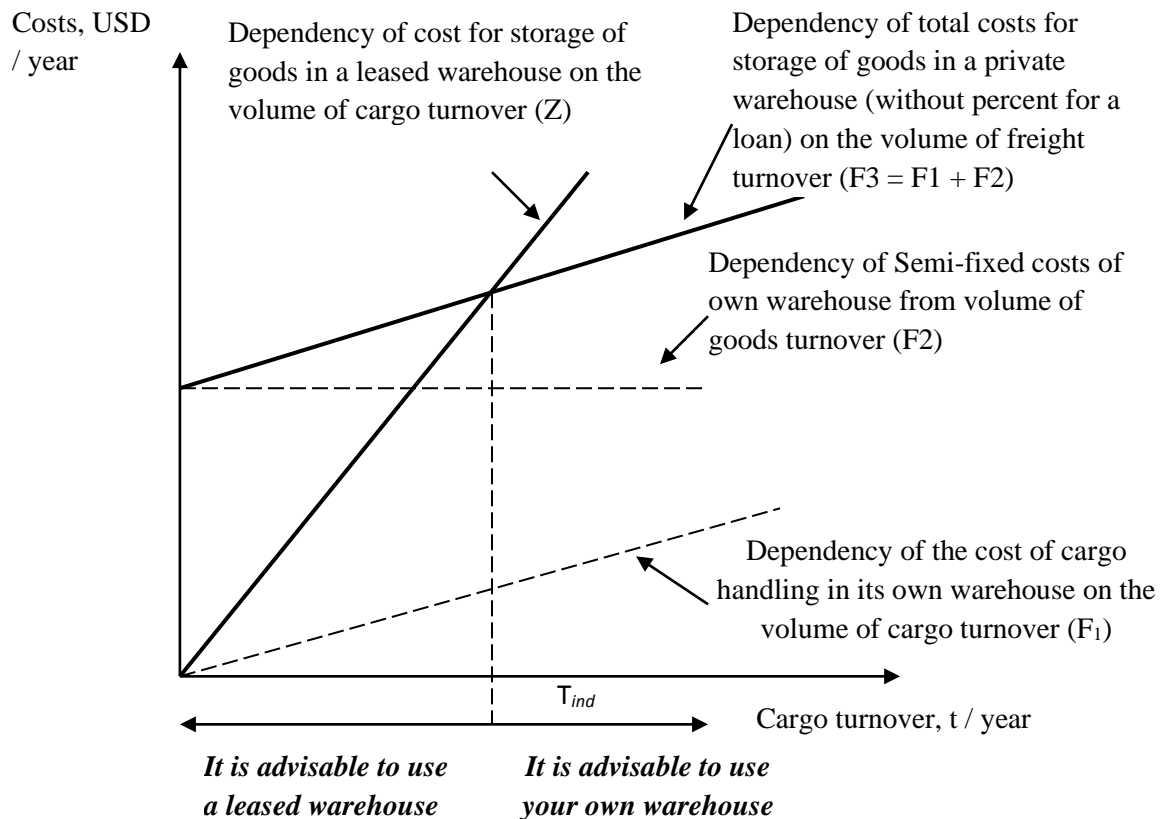
TASK 5. Decision-making about the use of leased (rented) warehouse services

The determination of the actual cost of cargo handling in a warehouse allows us to make informed decisions on the critical value of the freight turnover of a warehouse.

Wholesalers today most often have to choose between the organization of their own warehouse and the use of stock for the public warehouse. In the latter

case, the warehouse owner includes the performance of logistics operations in the cost of storage.

The choice between private and leased (rented) warehouse may be determined from the graph shown in Fig. 1.



1. Determine the cost of storage in your own warehouse.
2. Determine the cost of storage in a leased (rented) warehouse.
3. Construct the graphs that show the total costs in the warehouse. Identify areas of expediency of using warehouses.
4. Derive a formula for determining the "turnover of indifference".

No	Criteria	Absolute value notation	Dimension	Value
1	Unit cost of cargo handling in own warehouse	C_{unit}	Uah/ton	$4 + 0,1*(i+j)$
2	Semi-fixed costs of own warehouse	F_2	Uah/year	$30000 + 1000*(i+j)$
3	Tariff for leased (rented) warehouse services	α	Uah per $1m^2$ per day	$0,3 + 0,1*i$
4	The number of days of turnover of stocks product	D_{turn}	Days	$60 + (i+j)$
5	The number of working days per year	D_{work}	Days	$250 + 10*j$

6	Load on 1 m ² of storage area in a leased (rented) warehouse	η	Ton/m ²	$2 + 0,1*i$
7	Probable turnover of stocks product	T	Ton	0, 3000, 5000, 7000, 9000, 13000, 15000

Where i – the last numeral of the credit book
 j – the previous numeral of the credit book

TASK 6. Calculation of the turnover of indifference of the warehouse

1. Calculate the total cost of the warehouse functioning.
2. Determine the profit of the warehouse.
3. Determine "turnover of indifference".
4. Build a graph of the relationship between costs and revenues from the value of the turnover of the warehouse.

№	Criteria	Absolute value notation	Dimension	Value
1	The average cost of procurement of goods,	$C_{av.proc}$	Uah/ton	$6000+100*(i+j)$
2	The coefficient for calculating the payment of interest for a loan,	k	-	$0,045+0,001*i*j$
3	Trade mark-up for the wholesale sale of goods	$T_{mark-up}$	%	$7,8+0,1*i*j$
4	Costs for renting a warehouse	C_{rent}	Uah/year	$170000+1000*(i+j)$
5	Costs for amortization of equipment	C_{amor}	Uah/year	$30000+1000*(i+j)$
6	Electricity costs	C_{el}	Uah/year	$80000+1000*(i+j)$
7	Costs for staff and specialists	C_{staff}	Uah/year	$20000+1000*(i+j)$
8	The cost of cargo handling, per 1 ton of cargo turnover of the warehouse,	$C_{hand/1t}$	Uah/ton	$14+i$
9	The current turnover of the warehouse,	T_{cur}	Ton/year	$1600+100*j$

Where i – the last numeral of the credit book
 j – the previous numeral of the credit book