The program of the entrance exam for applicants to the PhD
for the group of educational programs
D148 – «Logistics»

I. General provisions

1. The program was drawn up in accordance with the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 «On Approval of the Model Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher and Postgraduate Education» (hereinafter referred to as the Model Rules).

2. The entrance exam for doctoral studies consists of writing an essay, an exam in the profile of a group of educational programs and an interview.

Блок	Баллы
1. Interview	30
2. Essay	20
3. Exam according to the profile of the group of the educational program	50
Total admission score	100/75

3.The duration of the entrance exam is 3 hours 10 minutes, during which the applicant writes an essay and answers the electronic examination ticket. The interview is conducted at the university premises before the entrance exam.

II. Procedure for the entrance examination

1. Applicants for doctoral studies in the group of educational programs D148 – «Logistics» write a problematic / thematic essay. The volume of the essay is at least 250words.

The purpose of the essay is to determine the level of analytical and creative abilities, expressed in the ability to build one's own argumentation based on theoretical knowledge, social and personal experience.

Types of essays:
- motivational essay revealing the motivation for research activities;
- scientific-analytical essay justifying the relevance and methodology of the planned research;
- problem/thematic essay reflecting various aspects of scientific knowledge in the subject area.

2. The electronic examination card consists of 3 questions

Topics for exam preparation according to the profile of the group of
the educational program:
Transport Logistics
Topic 1. Socio-economic nature of transport and its role in the logistics business
Subtopics: The economic essence of transport, transport output, and service quality.
The transport system of the Republic of Kazakhstan and the technical-economic
features of different types of transport.
Topic 2. Material and technical base for freight and commercial operations across
transport types
Subtopics: Characteristics of the material and technical base of different transport
modes. Performance indicators for the use of railcars, vessels, and vehicles in freight
transportation. Nomogram for calculating technical and operational indicators of road
transport.
Topic 3. Freight and cargo transportation characteristics
Subtopics: Classification and characteristics of cargo. Determining cargo weight for
transportation. Types, classification, and features of freight transport. Packaging,
containers, and pallets used for product transport. Transport-technological systems.
Container transport systems.
Topic 4. Freight rates and cost calculations across transport types
Subtopics: Pricing in the transport services market. Theoretical aspects of tariff
determination. Freight tariffs across transport modes.
Topic 5. Rationalization of freight transportation
Subtopics: Importance of rationalizing freight transport. Types and causes of inefficient
transport. Methods to eliminate inefficiencies. Optimization of transportation for
specific goods. Optimal transport radius for road freight from regional warehouses.
Linking consumers to suppliers using linear programming.
Topic 6. The impact of logistics factors on product competitiveness in foreign markets
Subtopics: Transport component in export pricing. Delivery terms and logistics clauses
in international contracts. Logistics providers and outsourcing of logistics services.
Topic 7. Transport logistics in the context of global economic integration
Subtopics: Current state and structure of the global logistics services market. Key
trends in logistics infrastructure development in international trade. Scientific and
technological progress in international logistics.
Topic 8. Transport logistics management in Kazakhstan
Subtopics: Management of transport logistics at the national level. Corporate transport
logistics management. Information flows in corporate logistics.
Topic 9. Water transport logistics management
Subtopics: Water transport management in Kazakhstan. Contractual aspects of water
freight. International agreements and conventions on water transport logistics. Ship
traffic organization. Key documents used in water transport contracts. Applicable water
transport tariffs in Russia. Planning procedures. Export/import shipping by sea.
Topic 10. Railway transport logistics management

Subtopics: Legal framework and organizational structures of Kazakhstan's railways. International railway organizations. Freight organization by rail. International rail freight agreements. Procedures for shipping to Western Europe. Rail freight contracts and tariffs in Kazakhstan.

Topic 11. Road freight and commercial operations

Subtopics: Organization of road freight deliveries. Route planning. Efficiency metrics for vehicle routes. Technical and operational indicators across multiple routes. Mathematical methods for freight transport organization. International road transport organization. Road transport tariffs.

Topic 12. Air transport logistics management

Subtopics: Role and significance of air transport in economic ties. Organization of air cargo transport. Air freight tariffs.

Warehouse Logistics

Topic 1. The role and importance of warehouse logistics in the logistics system

Subtopics: Main tasks and functions of warehousing. Classification of warehouses. Warehouse operations and their functions. Role of warehouse logistics in supply chains.

Topic 2. Warehouse layout and design

Subtopics: Requirements for warehouse facilities. Principles of warehouse layout. Zoning of warehouse space. Types of warehouse equipment and their characteristics. Automation and digitalization in warehouse operations.

Topic 3. Warehouse processes and operations

Subtopics: Main processes in warehouses: reception, storage, picking, packing, and shipment. Order picking systems. Inventory tracking and control. Performance indicators of warehouse operations.

Topic 4. Material handling systems in warehouses

Subtopics: Types of material handling equipment. Conveyor systems, forklifts, cranes. Selection criteria for warehouse equipment. Ergonomics and safety in warehouse operations.

Topic 5. Organization and management of warehouse activities

Subtopics: Warehouse management systems (WMS). Planning and scheduling of warehouse tasks. Labor management in warehouse logistics. Staff training and motivation.

Topic 6. Modern technologies in warehouse logistics

Subtopics: Application of barcoding, RFID, QR codes, and mobile technologies. Use of drones and robots in warehousing. E-commerce and its impact on warehouse logistics. Trends in warehousing digitalization.

Topic 7. Storage and packaging of goods

Subtopics: Types of packaging and containers. Influence of packaging on logistics. Requirements for storage conditions of different types of goods. Safety and quality control in storage.

Topic 8. Cost and efficiency analysis in warehousing

Subtopics: Cost structure of warehouse operations. Key performance indicators (KPIs). Methods for warehouse efficiency improvement. Outsourcing of warehouse services.

Inventory Management in the Logistics System

Topic 1. The essence and significance of inventory in logistics
Subtopics: Classification of inventory. Inventory functions in the logistics system. The role of inventory in ensuring continuity of supply and production.
Topic 2. Inventory costs and their optimization
Subtopics: Types of inventory-related costs. Trade-off between ordering and holding costs. Total inventory cost concept. Methods to reduce inventory costs.
Topic 3. Inventory planning and control systems
Subtopics: Inventory management methods (ABC/XYZ analysis, JIT, EOQ, VMI). Determining safety stock and reorder point. Continuous and periodic review systems.
Topic 4. Demand forecasting for inventory planning
Subtopics: Types and methods of forecasting. Quantitative and qualitative forecasting techniques. Forecast accuracy and its impact on inventory levels.
Topic 5. Inventory models and their application
Subtopics: Classical inventory models (Wilson model, probabilistic models). Inventory replenishment strategies. Inventory control in unstable demand environments.
Topic 6. IT solutions in inventory management
Subtopics: Inventory management software. Integration of inventory data into ERP systems. Use of digital platforms and analytics in stock control.
Topic 7. Inventory management in supply chains
Subtopics: Role of inventory in supply chain performance. Coordination between supply chain participants. Inventory visibility and transparency. Global inventory management.
Topic 8. Risk and sustainability in inventory management
Subtopics: Inventory-related risks. Inventory insurance and safety strategies. Sustainable inventory practices and green logistics.

Supply Chain Management

Topic 1. Introduction to Supply Chain Management
Subtopics: Concept and structure of the supply chain. Goals and objectives of supply chain management (SCM). Key participants in the supply chain. The difference between logistics and SCM. Evolution of supply chains in the global economy.

Topic 2. Supply chain design and configuration
Subtopics: Types of supply chains (push, pull, hybrid). Factors influencing supply chain configuration. Network design: location of suppliers, production, and distribution centers. Strategic vs. operational decisions in SCM.

Topic 3. Procurement and supplier relationship management
Subtopics: Procurement strategies (centralized vs. decentralized). Criteria for selecting and evaluating suppliers. Strategic sourcing. Partnership and collaboration with suppliers. Contract management.

Topic 4. Demand and supply planning in the supply chain
Subtopics: Demand forecasting and its role in SCM. Sales and Operations Planning (S&OP). Balancing demand and supply. The Bullwhip effect and methods to mitigate it.

Topic 5. Inventory and warehouse management in the supply chain
Subtopics: Role of inventory in the supply chain. Multi-echelon inventory

management. Coordination of warehouse and inventory decisions. Inventory visibility and real-time tracking.

Topic 6. Production and distribution in SCM
Subtopics: Production planning and scheduling. Make-to-stock vs. make-to-order systems. Distribution strategies and models. Selection of distribution channels and partners.

Topic 7. Transportation and logistics in the supply chain
Subtopics: Transportation modes and their role in SCM. Freight management and route optimization. Transportation cost analysis. Coordination of transport and warehousing operations.

Topic 8. Information systems and digital technologies in SCM
Subtopics: Role of IT in supply chain integration. ERP, SCM, and CRM systems. Blockchain, AI, IoT in supply chains. E-commerce and digital supply chains.

Topic 9. Risk management and sustainability in the supply chain
Subtopics: Identification and classification of supply chain risks. Risk mitigation strategies. Resilient supply chains. Sustainable SCM: green logistics, ethical sourcing, and circular economy.

Topic 10. Performance evaluation and improvement in supply chains
Subtopics: Key Performance Indicators (KPIs) for SCM. Benchmarking and best practices. Lean and agile supply chains. Continuous improvement and innovation in SCM.

III List of references

Main:
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9. Levkin, G. G. (2023). *Commercial logistics* [Textbook for universities, 2nd ed., revised and expanded]. Moscow: Yurayt Publishing. 375 p.

10. Medvedev, V. A. (2022). *Information logistics* [Textbook]. Moscow; Vologda: Infra-Inzheneriya. 472 p.

Additional:
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7. http://logistik03.narod.ru/Index.htm
8. http://www.devbusiness.ru/development/logistics.htm

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12. Tyapukhin, A. P. (2024). Logistics in 2 parts. Part 1 [Textbook for universities, 3rd ed., revised and expanded]. Moscow: Yurayt Publishing. 386 p.