AL-FARABI KAZAKH NATIONAL UNIVERSITY

FACULTY OF GEOGRAPHY AND ENVIRONMENTAL SCIENCES  
DEPARTMENT OF GEOGRAPHY, LAND MANAGEMENT AND CADASTRE

PROGRAM  
 FINAL DISCIPLINE EXAM  
  
 UPPGT 6305 " Environmental management using geoinformation technologies"  
  
 "7M05204 - «ГУОС-Геопространственное управление окружающей средой"

ALMATY, 2020

The program of the final exam in the discipline "Quantitative methods in geographical analysis (data)" in the specialty "7M05204-ГУОС-Геопространственное управление окружающей средой" was prepared by the senior lecturer of the Department of Geography, Land Management and Cadastre of KazNU named after Al-Farabi Kelinbaeva R.Zh.

The program was considered at a meeting of the Department of Geography, Land Management and Cadastre

Protocol № \_\_\_ from «14» december 2020 y.

Head of the Department \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ G.N. Nyusupova

1. **INTRODUCTION**

The maximum performance indicator for midterm controls and a half-semester exam in the discipline "Quantitative Methods in Geographic Analysis (Data)" as a result is 100 points maximum for each midterm control and MT, including the results of current controls.  
If a student during the semester has not scored points for midterm controls and MT for a valid reason, documented (due to illness with the provision of supporting documents, etc.), he may be given an “I” (“Incomplete”) mark. To correct the "I" for a standard grade, the student who has received the appropriate permission must meet with the teacher and determine the amount and types of work required to perform.  
The final mark for the discipline is calculated according to the following formula: (RK1 + MT + RK2) / 3x0.6 + (IEx0.4). Thus, midterm controls and MT make up 60%, the final control (final exam) is 40% of the final grade in the discipline.  
Admission to the examination session is issued by the order of the dean of the faculty. The following are not allowed for the final control (exam):  
• students who scored less than 50 points according to the results of midterm controls and MT (RK1 + MT + RK2) / 3;  
• students who have more than 50% of missing classes in the discipline, regardless of the availability of supporting documents;  
• students who have not passed term papers (projects) in the relevant discipline;  
• students on the basis of an agreement for the provision of paid educational services who have arrears in payment for education.  
  
The exam in the discipline "Quantitative Methods in Geographic Analysis (Data)" for students of the specialty "5В060900 - Geography" was prepared in the form of on-line testing on the basis of the educational platform dl.kaznu.kz with the open source LMS Moodle.  
An examination test of 50 questions becomes available for passing on the day of the exam (set by the course teacher according to the approved exam schedule). The bank of tasks in the test form is prepared taking into account the requirements of testology and is structured by categories (topics). The student is given 25 test questions for a time interval of 60 minutes.  
Various types of questions were used: Multiple choice (a student chooses an answer to a question from several options offered to him, and the questions may suggest one or several correct answers at once); True / False (answer to the question, the student chooses between two options "True" and "False"); Compliance (each element of the answers of the first group must be matched with an element of the answers of the second group); Short answers (the answer to the question is a word or a short phrase, several correct answers with different grades are allowed);  
The maximum score for a fully completed test is 100 points.

**II TOPICS FOR DRAFTING EXAMINATIONS**

1. Expand the essence of geographic information systems. Tell the story of the development of GIS.  
2. Give a definition to new information technologies, justify their importance and role in land management and cadastre.  
3. Describe geographic information systems and their products. Indicate their features and differences.  
4. Describe the functionality of Word.  
5. Explain the applied aspects of GIS in land management and cadastre  
6. Describe the functionality of the GIS. Define the shapefile format  
7. Define a geographic database  
8. Describe the additional GIS modules. Give examples of their application in different fields of activity  
9.Name the official distributors of GIS software  
10. Explain the features and differences between the geodatabase and shapefiles  
11. Explain the labels of the layers Arc Mar. Describe the use of the Maplex module.  
12. Explain the differences between personal and corporate geodatabases  
13. What are the main data formats supported by Arc GIS.  
14. Define metadata.  
15. Describe Arc GIS applications - Arc Map, Arc Toolbox, Аrc Сatalog  
16. Expand the process of labeling features in ArcMap. Specify methods for labeling objects.  
17. Give the definition of the topology. Indicate what topological relationships exist. Give an example of topological errors.  
18. Unleash the Power of Annotation in GIS  
19. Describe the Maplex plug-in  
20. What are the types of charts in Arc Mar  
21. Describe the layers of the geographic base of the maps.  
22. Give the definition of the raster data format in the GIS.  
23. Name the coordinate systems. Describe the spatial reference. Indicate the differences in projections for different territories.  
24. Give the definition of the vector data format in GIS  
25. Describe the Layer format  
26. Tell us about card templates. Describe the process for applying card templates.  
27. Specify the elements of the map layout. Describe the process of assembling the map.  
28. Indicate the features and differences between Data View and Layout View in Arc Map  
29. Expand the structure of the geodatabase. Give an example.  
30. Name the types of fields in the attribute table and describe each of them.

**III RECOMMENDED SOURCES FOR EXAM PREPARATION**

Main:  
1. Karmanov A.G., Knyshev A.I., Eliseeva V.V. Geographic Information Systems of Territorial Management: Textbook - SPb: ITMO University, 2015.  
2. Esri Press, ArcGIS World - Applying The Science of Where - 10 Great Ideas ™, 380 New York Street, Redlands, CA, USA 92373-8100 Copyright © 2017 Esri  
3. Kurlovich, D.M. Geoinformation methods of analysis and forecasting of weather: study guide. allowance / D.M. Kurlovich. - Minsk: BSU, 2013.  
4. Clemmer, Gina. 2013. The GIS 20: Essential Skills. Redlands California: ESRI Press.  
5. Cope, Megan and Elwood, Sarah. 2009. Qualitative GIS: A Mixed Methods Approach. Sage.  
6. Harder, Christian; Ormsby, Tim; and Balstrom, Thomas. 2013. Understanding GIS: An ArcGIS workbook. Redlands California: ESRI press.  
7. Keranen, Kathryn. 2012. Making Spatial Decisions Using GIS: A Workbook. Redlands California: ESRI Press.  
  
Additional:  
1. 8. Longley, Paul; Goodchild, Michael; Maguire, David; and Rhind, David. 2011. Geographic Information Systems and Science. Wiley  
2. Sharygin M.D., Chupina L.B. The current state and place of theoretical geography in the system of scientific knowledge // Geographical Bulletin. 2010. No. 3 (14).