**The final exam program on the discipline “Parallel programming”**

**of 2022 – 2023 academic year**

Faculty: Information Technologies.

Department: Information systems.

Code and name of the educational program: 6B06102 – Information systems.

Name of the discipline: Parallel programming

Course: 4

Teacher: Vladislav Karyukin

The form of the final control of the academic discipline – online test.

**The control of the exam** – online proctoring.

Proctoring technology (English “proctor” – to control the exam course). In the classrooms, proctors make sure that the examinees pass the test honestly; they complete the assignments on their own and do not use additional materials. Each student must be sure to familiarize himself / herself with the rules of the exam.

***Exam duration*** – 60 minutes.

***The number of test questions***: 25

**EXAM REGULATIONS**

The exam is held on schedule. Therefore, all students must come to the exam in advance.

**The topics of the exam**

1. Getting started with parallel computing
2. Memory organization
3. Parallel programming models
4. Python in parallel programming
5. Thread-based parallelism
6. Thread synchronization with Lock and RLock
7. Using the mpi4py Python module
8. Subclass processes
9. mpi4py Python module
10. Distributed python
11. GPU programming with python
12. PyCUDA
13. PyCUDA matrix multiplication
14. NumbaPRO
15. PyOpenCL application

**Literature**

# Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg, Elliott Hauser, Aimee Andrion, 2016

# Python Cookbook: Recipes for Mastering Python 3 3rd Edition, Kindle Edition by David Beazley, Brian K. Jones, 2013

# Advanced Python Development: Using Powerful Language Features in Real-World Applications 1st ed. Edition by Matthew Wilkes, 2021

1. Natural Language Processing with Python and spaCy: A Practical Introduction, Yuli Vasiliev, 2021
2. Learning Scientific Programming with Python, Christian Hill, 2021

**Grade scale:**

|  |  |  |  |
| --- | --- | --- | --- |
| «excellent» - | А | 4,0 | 95-100 |
| А- | 3,67 | 90-94 |
| «good» -  | В+ | 3,33 | 85-89 |
| В | 3,0 | 80-84 |
| В- | 2,67 | 75-79 |
| С+ | 2,33 | 70-74 |
| «satisfied» -  | С | 2,0 | 65-69 |
| С- | 1,67 | 60-64 |
| D+ | 1,33 | 55-59 |
| D- | 1,0 | 50-54 |
| «unsatisfied» -  | FX | 0,5 | 25-49 |
| F | 0 | 0-24 |