**Block 1. A separate question from this block is 34 points.**

Monte Carlo methods. General scheme for solving problems by Monte Carlo methods.

Random variable and their numerical characteristics.

Inequality of Chebyshev.

Recurrent formulas for modeling some random variables and vectors.

Modeling of some random variables. General and special methods.

Modeling the mean free path of a neutron.

Multidimensional isotropic vector and modeling algorithms. The choice random direction in space.

Calculation of the queuing system (QS). Algorithm. Simple stream (Poisson flow) Modeling.

The calculation of the passage of neutrons through the plate. Free path. The choice random direction. Probability of absorption. Algorithm.

Calculations of certain integrals by Monte Carlo methods. Method substantial sampling.

Assessment of variance. Distribution density theorem.

The algorithm for computing (estimating) a certain integral.

The solution of systems of linear algebraic equations. Stochastic matrix.

A homogeneous Markov chain with a finite number of states. Asymptotically unbiased estimates.

The decision of the paired system.

Implementation of the algorithm for solving SLAE on a PC.

**Block 2. A separate question from this block is 33 points.**

The class of integral equations (IE). Neumann series. Existence of a Yiwu solution.

Modeling a homogeneous Markov chain.

The integral equation and the homogeneous Markov chain.

Probabilities of events,,.

The main assessment of the decision PS. Conditions sufficient for the finiteness of the average states.

Algorithm for constructing a basic assessment of the solution of IE.

Proof of the bias of the main estimate. Theorem.

Assessment of the decision of the associated DUT.

Dispersion of the main assessment. Statement.

Evaluation of the solution at a given point. Local rating.

The sub-stochastic core of AI. Direct modeling.

Measurement of acquisitions.

The “ideal” Markov chain.

Type estimation with zero dispersion.

An example of solving the IE by the Monte Carlo method. The process of radiation transfer with strongly anisotropic scattering. Best rating.

The process of “wandering around the spheres”. Algorithms for modeling the process of “wandering around spheres ".

**Block 3. A separate question from this block is 33 points.**

Solution of the Dirichlet problem for the Helmholtz equation. Algorithm.

Solution of the Dirichlet problem for the Poisson equation. Algorithm.

Integral representation of a solution using the Green's function for an operator Helmholtz for the ball.

Integral representation of a solution using the Green's function for an operator Poisson for the ball.

Modeling of the Markov chain “walk on spheres” for solving the Dirichlet problem for the Helmholtz equation. Algorithm.

Modeling Markov chain “wandering around spheres” to solve the Dirichlet problem for the Poisson equation. Algorithm.

Unrealizable unbiased assessment. Decision Assessment Modeling Algorithms Dirichlet problems for the Helmholtz equation.

Unrealizable unbiased assessment. Decision Assessment Modeling Algorithms for the Dirichlet problems for the Poisson equation.

Implemented biased assessment. Decision Assessment Modeling Algorithms for the Dirichlet problems for the Helmholtz equation.

Implemented biased assessment. Decision Assessment Modeling Algorithms for the Dirichlet problems for the Poisson equation.

Evaluation of the right side of the integral equation for one random "node".

The theorem on the uniformly bounded variance of a random variable.

An estimate of the derivatives of the solution of the Dirichlet problem for the Poisson equation.

The algorithm for numerical modeling of some random variables – estimates of the integrals entering the right-hand side of the integral equation in one random for node.

Evaluation of the derivatives of the decision by parameter.

Algorithms for modeling the estimation of derivatives of the solution of the Dirichlet problem for Helmholtz equations in parameter.