▸ MARGARITA LEONTYEVA, *Decidable Boolean algebras of elementary characteristics (1,0,1).*
Department of Mechanics and Mathematics, Novosibirsk State University, Russian Federation.
E-mail: miss-leontieva@ngs.ru.

A computable Boolean algebra is said to be *n-constructive* if there exists an algorithm determining whether the given tuple satisfies given finite Σ_n-formula. A *strongly constructive* Boolean algebra is one for which such an algorithm exists for all formulas of the predicate calculus. Boolean algebra is *decidable* if there exists its strongly constructive isomorphic copy.

If $\mathfrak{A}$ is a Boolean algebra, then $\mathrm{At}(\mathfrak{A})$ is the set of atoms of $\mathfrak{A}$, $\mathrm{Atm}(\mathfrak{A})$ is the ideal of atomic elements, $\mathrm{Als}(\mathfrak{A})$ is the ideal of atomless elements, $\mathrm{E}(\mathfrak{A}) = \mathrm{Atm}(\mathfrak{A}) + \mathrm{Als}(\mathfrak{A})$ is the Ershov-Tarski ideal and F is Frechet ideal.

Relations between computability of $\mathrm{At}(\mathfrak{A})$, $\mathrm{Atm}(\mathfrak{A})$, $\mathrm{Als}(\mathfrak{A})$, $\mathrm{E}(\mathfrak{A})$ and decidability of Boolean algebra $\mathfrak{A}$ began to be studied in the articles of Ershov in 1964.

Let $\mathfrak{A}$ be a computable Boolean algebra of elementary characteristics (1,0,1). This means that $\mathfrak{A}/\mathrm{E}$ is a nontrivial atomless Boolean algebra. Let S be a subset of the set $\{\mathrm{At}, \mathrm{Atm}, \mathrm{Als}, \mathrm{E}\}$. We consider a general question: if the predicates in S are computable in $\mathfrak{A}$ then can we state that $\mathfrak{A}$ is decidable? It was proved earlier that if $\mathrm{S} = \{\mathrm{At}, \mathrm{Als}\}$ then the answer is yes, and if $\mathrm{S} = \{\mathrm{At}\}$ or $\mathrm{S} = \{\mathrm{Als}, \mathrm{Atm}, \mathrm{E}\}$ then the answer is no. In theorems 1 and 2 we complete this theme.

Theorem 1 Let $\mathfrak{A}$ be a computable Boolean algebra of elementary characteristics (1, 0, 1). If $\mathrm{At}(\mathfrak{A})$ and $\mathrm{Atm}(\mathfrak{A})$ are computable then $\mathfrak{A}$ is decidable.

Theorem 2 There exists a computable Boolean algebra $\mathfrak{A}$ of elementary characteristics (1, 0, 1) with computable $\mathrm{At}(\mathfrak{A})$ and $\mathrm{E}(\mathfrak{A})$ which is not decidable.

During the work with theorem 2 the following description of Δ^0_6-computable Boolean algebras was obtained. Let $\mathrm{T} = (\mathrm{Atm} \to \mathrm{F}) + \mathrm{Atm}$, where $\mathrm{Atm} \to \mathrm{F} = \{x | \forall z \leq x (z \in \mathrm{F} \vee z \notin \mathrm{Atm})\}$.

Theorem 3 $\mathfrak{A}$ is Δ^0_6-computable Boolean algebra if and only if there exists a computable Boolean algebra $\mathfrak{C}$ such that $\mathfrak{C}/T \cong \mathfrak{A}$.