Russian Mathematics (Iz. VUZ) *Izvestiya VUZ. Matematika*
Vol. 43, No. 8, pp.50–55, 1999 *UDC 512.579*

ON CONDITIONALLY RATIONAL-EQUIVALENT DISCRIMINATOR VARIETIES

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The concept of a conditional term was introduced by the author in [1]. Basing on this concept, in [2] the notion of a conditional rational equivalence between universal algebras and their classes was introduced, which generalizes the known notion of the rational equivalence. In [3]–[5] the conditional rational equivalence between various finite algebras was studied, while in [6] the invariants of the relations of conditional rational equivalence between locally-finite Yonsson universal classes of algebras were described. In [1] it was noted that on discriminator algebras the conditionally termal functions are termal and by the same token the conditionally rational equivalence between discriminator algebras is equivalent to rational equivalence. In the present article a similar result is proved for locally-finite discriminator varieties, the set-theoretic invariants of classes of rational (conditionally rational) equivalent locally-finite discriminator varieties are described.

Let us recall the necessary definitions. By a condition of signature we shall mean a finite set of equalities and inequalities between the terms $t_j^i(\overline{x})$ of signature σ

$$\mathcal{T}(\overline{x}) = \begin{cases} t_1^1(\overline{x}) =^{i_1} t_2^1(\overline{x}); \\ \cdots\cdots\cdots \\ t_1^n(\overline{x}) =^{i_n} t_2^n(\overline{x}), \end{cases}$$

where $=^1$ is $=$, $=^0$ is $\neq$, $i_j \in \{0,1\}$. By a complete system of conditions we understand a set $\{\mathcal{T}_1(\overline{x}), \dots, \mathcal{T}_k(\overline{x})\}$ of conditions such that the formula $\bigvee\limits_{i=1}^{k} \mathcal{T}_i(\overline{x})$ is identically true, and for any $r \neq p \leq k$ the formulas $\mathcal{T}_r(\overline{x}) \& \mathcal{T}_p(\overline{x})$ are false. The concept of a conditional term is defined by the following induction:

a) the variables and any constants of signature σ are conditional terms of this signature,
b) if $t_1(\overline{x}), \dots, t_n(\overline{x})$ are conditional terms of signature σ and f is an n-ary functional symbol of signature σ, then $f(t_1(\overline{x})), \dots, f(t_n(\overline{x}))$ is also a conditional term of signature σ;
c) if $t_1(\overline{x}), \dots, t_n(\overline{x})$ are conditional terms of signature σ, and $\{\mathcal{T}_1(\overline{x}), \dots, \mathcal{T}_n(\overline{x})\}$ is a complete system of conditions of this signature, then

$$t(\overline{x}) = \begin{cases} \mathcal{T}_1(\overline{x}) \to t_1(\overline{x}); \\ \cdots\cdots\cdots \\ \mathcal{T}_n(\overline{x}) \to t_n(\overline{x}) \end{cases}$$

is also a conditional term of signature σ;
d) any conditional term of signature σ is determined within a finite number of steps by the rules a)–c).

Supported by Russian Foundation for Basic Research (code of project 96-01-01675).