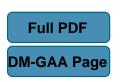
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FOUR-PART SEMIGROUPS - SEMIGROUPS OF BOOLEAN OPERATIONS

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Abstract

Four-part semigroups form a new class of semigroups which became important when sets of Boolean operations which are closed under the binary superposition operation $f+g:=f(g,\ldots,g)$, were studied. In this paper we describe the lattice of all subsemigroups of an arbitrary four-part semigroup, determine regular and idempotent elements, regular and idempotent subsemigroups, homomorphic images, Green's relations, and prove a representation theorem for four-part semigroups.

Keywords: four-part semigroup, Boolean operation.

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References

- [1] R. Butkote and K. Denecke, Semigroup Properties of Boolean Operations, Asian-Eur. J. Math. 1 (2008) 157–176.
- [2] R. Butkote, Universal-algebraic and Semigroup-theoretical Properties of Boolean Operations (Dissertation Universität Potsdam, 2009).

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