

WREATH PRODUCT OF A SEMIGROUP AND A Γ -SEMIGROUP

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Abstract

Let $S = \{a, b, c, \dots\}$ and $\Gamma = \{\alpha, \beta, \gamma, \dots\}$ be two nonempty sets. S is called a Γ -semigroup if $a\alpha b \in S$, for all $\alpha \in \Gamma$ and $a, b \in S$ and $(a\alpha b)\beta c = a\alpha(b\beta c)$, for all $a, b, c \in S$ and for all $\alpha, \beta \in \Gamma$. In this paper we study the semidirect product of a semigroup and a Γ -semigroup. We also introduce the notion of wreath product of a semigroup and a Γ -semigroup and investigate some interesting properties of this product.

Keywords: semigroup, Γ -semigroup, orthodox semigroup, right(left) orthodox Γ -semigroup, right(left) inverse semigroup, right(left) inverse Γ -semigroup, right(left) α -unity, Γ -group, semidirect product, wreath product.

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REFERENCES

- [1] S. Chattopadhyay, *Right Inverse Γ -semigroup*, Bull. Cal. Math. Soc. **93** (2001), 435–442.
- [2] S. Chattopadhyay, *Right Orthodox Γ -semigroup*, Southeast Asian Bull. of Math **29** (2005), 23–30.
- [3] J.M. Howie, *An introduction to semigroup theory*, Academic Press 1976.
- [4] W.R. Nico, *On the regularity of semidirect products*, J. Algebra **80** (1983), 29–36.
- [5] T. Saito, *Orthodox semidirect product and wreath products of semigroups*, Semigroup Forum **38** (1989), 347–354.
- [6] M.K. Sen and S. Chattopadhyay, *Semidirect Product of a Semigroup and a Γ -semigroup*, East-West J. of Math. **6** (2) (2004), 131–138.
- [7] M.K. Sen and N.K Saha, *On Γ -semigroup I*, Bull. Cal. Math. Soc. **78** (1986), 181–186.
- [8] P.S. Venkatesan, *Right(left) inverse semigroup*, J. of Algebra (1974), 209–217.
- [9] R. Zhang, *A Note on Orthodox Semidirect Products and Wreath Products of Monoids*, Semigroup Forum **58** (1999), 262–266.

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