Full PDF

DM-GAA Page

ON THE MAXIMAL SUBSEMIGROUPS OF THE SEMIGROUP OF ALL MONOTONE TRANSFORMATIONS

ILIYA GYUDZHENOV AND ILINKA DIMITROVA[1]

South-West University "Neofit Rilski"
Faculty of Mathematics and Natural Science
2700 Blagoevgrad, Bulgaria

e-mail: iliadg@aix.swu.bg
e-mail: ilinka_dimitrova@yahoo.com

Abstract

In this paper we consider the semigroup M_n of all monotone transformations on the chain X_n under the operation of composition of transformations. First we give a presentation of the semigroup M_n and some propositions connected with its structure. Also, we give a description and some properties of the class $\tilde{J}_{n-1}$ of all monotone transformations with rank $n-1$. After that we characterize the maximal subsemigroups of the semigroup M_n and the subsemigroups of M_n which are maximal in $\tilde{J}_{n-1}$.

Keywords: transformation semigroup, maximal subsemigroups, idempotent, isotone, antitone and monotone transformations, Green's equivalences.

2000 Mathematics Subject Classification: 20M20.

References

[1] H. Clifford and G.B. Preston, *The algebraic theory of semigroups*, 1. Amer. Math. Soc., Providence, 1961, MR 24#A2627.

[2] V.H. Fernandes, G.M.S. Gomes and M.M. Jesus, *Presentations for Some Monoids of Partial Transformations on a Finite Chain*, Communications in Algebra **33** (2005), 587–604.

[3] Il. Gyudzhenov and Il. Dimitrova, *On Properties of Idempotents of the Semigroup of Isotone Transformations and it Structure*, Comptes rendus de l'Academie bulgare des Sciences, to appear.

[4] J.M. Howie, *Products of Idempotents in Certain Semigroups of Transformations*, Proc. Edinburgh Math. Soc. **17** (2) (1971), 223–236.

[5] J.W. Nichols, *A Class of Maximal Inverse Subsemigroups of T_X*, Semigroup Forum **13** (1976), 187–188.

[6] N.R. Reilly, *Maximal Inverse Subsemigroups of T_X, Semigroup Forum*, Subsemigroups of Finite Singular Semigroups, Semigroup Forum **15** (1978), 319–326.

[7] Y. Taijie and Y. Xiuliang, *A Classification of Maximal Idempotent-Generated*, **4** (2002), 243–264.

[8] K. Todorov and L. Kračolova, *On the Rectangular Bands of Groups of D-Classes of the Symmetric Semigroup*, Periodica Mathem. Hungarica **13** (2) (1983), 97–104.

[9] Y. Xiuliang, *A Classification of Maximal Inverse Subsemigroups of Finite Symmetric Inverse Semigroups*, Communications in Algebra **27** (1999), 4089–4096.

[10] Y. Xiuliang, *A Classification of Maximal Subsemigroups of Finite Order-Preserving Transformation Semigroups*, Communications in Algebra **28** (3) (2000), 1503–1513.

[11] Y. Xiuliang and Lu Chunghan, *Maximal Properties of Some Subsemigroups in Finite Order-Preserving Transformation Semigroups*, Communications in Algebra **28** (2000), 3125–3135.