

BI-INTERIOR IDEALS OF Γ -SEMIRINGS

MARAPUREDDY MURALI KRISHNA RAO

Department of Mathematics
GIT, GITAM University
Visakhapatnam-530 045, Andhra Pradesh, India

e-mail: mmarapureddy@gmail.com

AND

B. VENKATESWARLU

Department of Mathematics
GST, GITAM University
Bengaluru North-562 163, Karnataka, India

e-mail: bvlmaths@gmail.com

Abstract

In this paper, as a further generalization of ideals, we introduce the notion of bi-interior ideal as a generalization of quasi ideal, bi-ideal and interior ideal of Γ -semiring and study the properties of bi-interior ideals of Γ -semiring. We prove that if M is a field Γ -semiring, then M is a bi-interior simple Γ -semiring.

Keywords: quasi ideal, bi-ideal, interior ideal, bi-interior ideal, bi-quasi ideal, regular Γ -semiring, bi-interior simple Γ -semiring.

2010 Mathematics Subject Classification: 16Y60, 06Y99.

REFERENCES

- [1] R.A. Good and D.R. Hughes, *Associated groups for a semigroup*, Bull. Amer. Math. Soc. **58** (1952) 624-625.
- [2] M. Henriksen, *Ideals in semirings with commutative addition*, Amer. Math. Soc. Notices **5** (1958) 321.
- [3] K. Iseki, *Quasi-ideals in semirings without zero*, Proc. Japan Acad. **34** (1958) 79–84. doi:10.3792/pja/1195524783
- [4] K. Iseki, *Ideal theory of semiring*, Proc. Japan Acad. **32** (1956) 554-559. doi:10.3792/pja/1195525272

- [5] K. Iseki, *Ideal in semirings*, Proc. Japan Acad. **34** (1958) 29–31.
doi:10.3792/pja/1195524845
- [6] R.D. Jagatap and Y.S. Pawar, *Quasi-ideals and minimal quasi-ideals in Γ -semirings*, Novi Sad J. Math. **39** (2009) 79–87.
dmi.uns.ac.rs/nsjom/Papers/39-2/NSJOM-39-2-079-087.pdf.
- [7] S. Lajos, *On the bi-ideals in semigroups*, Proc. Japan Acad. **45** (1969) 710–712.
doi:10.3792/pja/1195520625
- [8] S. Lajos and F.A. Szasz, *On the bi-ideals in associative ring*, Proc. Japan Acad. **46** (1970) 505–507.
doi:10.3792/pja/1195520265
- [9] H. Lehmer, *A ternary analogue of abelian groups*, Amer. J. Math. **59** (1932) 329–338.
doi:10.2307/2370997
- [10] M. Murali Krishna Rao, *Γ -semirings-I*, Southeast Asian Bull. Math. **19** (1995) 49–54.
- [11] M. Murali Krishna Rao, *Ideals in ordered Γ -semirings*, Discuss. Math. Gen. Algebra Appl. **38** (2018) 47–68.
doi:10.7151/dmgaa.1284
- [12] M. Murali Krishna Rao, *On Γ -semiring with identity*, Discuss. Math. Gen. Algebra Appl. **37** (2017) 189–207.
doi:10.7151/dmgaa.1276
- [13] M. Murali Krishna Rao, *Γ -semirings-II*, Southeast Asian Bull. Math. **21** (1997) 281–287.
- [14] M. Murali Krishna Rao, *The Jacobson radical of Γ -semiring*, Southeast Asian Bull. Math. **23** (1999) 127–134.
- [15] Marapureddy Murali Krishna Rao, *Bi-quasi-ideals and fuzzy bi-quasi ideals of Γ -semigroups*, Bull. Int. Math. Virtual Inst. **7** (2017) 231–242.
<http://oaji.net/articles/2016/1599-1480851272.pdf>.
- [16] Marapureddy Murali Krishna Rao, *Bi-interior ideals of semigroups*, Discuss. Math. Gen. Algebra Appl. **38** (2018) 69–78.
doi:10.7151/dmgaa.1283
- [17] M. Murali Krishna Rao and B. Venkateswarlu, *Regular Γ -incline and field Γ -semiring*, Novi Sad J. Math. **45** (2015) 155–171.
doi:10.30755/NSJOM.2014.058
- [18] M. Murali Krishna Rao, B. Venkateswarlu and N. Rafi, *Bi-quasi-ideals of Γ -semirings*, Asia Pacific J. Math. **4** (2017) 144–153.
- [19] M. Murali Krishna Rao, *Left bi-quasi ideals of semirings*, Bull. Int. Math. Virtual Inst. **8** (2018) 45–53.
doi:10.7251/BIMVI1801045R

- [20] N. Nobusawa, *On a generalization of the ring theory*, Osaka. J. Math. **1** (1964) 81–89. ir.library.osaka-u.ac.jp/dspace/bitstream/11094/12354/1/ojm_01-01-08.pdf.
- [21] M.K. Sen, *On Γ -semigroup*, in: Proceedings of International Conference of algebra and its application,, Decker Publication (Ed(s)), (New York, 1981) 301–308.
- [22] A.M. Shabir and A. Batod, *A note on quasi ideal in semirings*, Southeast Asian Bull. Math **7** (2004) 923–928.
- [23] O. Steinfeld, *Uher die quasi ideals*, Von halbgruppens Publ. Math. Debrecen **4** (1956) 262–275.
- [24] H.S. Vandiver, *Note on a simple type of algebra in which cancellation law of addition does not hold*, Bull. Amer. Math. Soc. (N.S.) **40** (1934) 914–920.
[doi:10.1090/s0002-9904-1934-06003-8](https://doi.org/10.1090/s0002-9904-1934-06003-8)

Received 19 April 2018

Revised 9 August 2018

Accepted 4 Septemeber 2018