ON THE PERIODIC PART OF A SHUNKOV GROUP SATURATED WITH LINEAR AND UNITARY GROUPS OF DEGREE 3 OVER FINITE FIELDS OF ODD CHARACTERISTIC

A. A. Shlepkin

Let G be a group, and let $\mathfrak{X}$ be a set of groups. A group G is saturated with groups from the set $\mathfrak{X}$ if any finite subgroup of G is contained in a subgroup of G isomorphic to some group from $\mathfrak{X}$. If all elements of finite orders from G are contained in a periodic subgroup $T(G)$ of G, then $T(G)$ is called the periodic part of G. A group G is called a Shunkov group if, for any finite subgroup H of G, in $G/N(G)$ any two conjugate elements of prime order generate a finite group. A Shunkov group may have no periodic part. It is proved that a Shunkov group saturated with finite linear and unitary groups of degree 3 over finite fields of characteristic 2 has a periodic part, which is isomorphic to either a linear or a unitary group of degree 3 over a suitable locally finite field of characteristic 2.

Keywords: groups with saturation conditions, Shunkov group, periodic part of a group.

REFERENCES

1. Ditsman A.P. On the center of p-groups. In: *Proc. seminar on group theory.* Moscow, 1938, pp. 30–34.

2. Kargapolov M.I., Merzljakov Yu.I. *Fundamentals of the theory of groups.* N Y; Heidelberg; Berlin: Springer-Verlag, 1979, 203 p. ISBN: 978-1-4612-9966-0 . Original Russian text (3rd ed.) published in Kargapolov M.I., Merzlyakov Yu.I. *Osnovy teorii grupp.* Moscow: Nauka Publ., 1982, 288 p.

3. Lytkina D.V., Mazurov V.D. Periodic groups saturated with $L_3(2^m)$. *Algebra and Logic*, 2007, vol. 46, no. 5, pp. 330–340. doi: 10.1007/s10469-007-0033-z .

4. Lytkina D.V., Tukhvatullina L.R., Filippov K.A. Periodic groups saturated by finite simple groups $U_3(2^m)$. *Algebra Logic*, 2008, vol. 47, no. 3, pp. 166–175. doi: 10.1007/s10469-008-9011-3 .

5. Lytkina D.V. Groups saturated by finite simple groups. *Algebra and Logic*, 2009, vol. 48, no. 5, pp. 357–370. doi: 10.1007/s10469-009-9063-z .

6. Senashov V.I., Shunkov V.P. *Gruppy s usloviyami konechnosti* [Groups with finiteness conditions]. Novosibirsk: Izdatel'stvo Rossiiskoi Akademii Nauk, Sibirskoe Otdelenie, 2001, 336 p. ISBN: 5-7692-0439-7 .

7. Senashov V.I. On Shunkov groups with a strongly embedded almost layer-finite subgroup. *Trudy Inst. Mat. i Mekh. UrO RAN*, 2010, vol. 16, no. 3, pp. 234–239 (in Russian).

8. Senashov V.I., Shunkov V.P. Almost layer-finiteness of the periodic part of a group without involutions. *Discrete Math. Appl.*, 2003, vol. 13, no. 4, pp. 391–404. doi: 10.1515/156939203322556054 .

9. Senashov V.I. Characterization of groups with generalized Chernikov periodic part. *Math. Notes*, 2000, vol. 67, no. 2, pp. 218–222. doi: 10.1007/BF02686249 .

10. Sozutov A.I., Suchkov N.M., Suchkova N.G. *Beskonechnye gruppy s involyutsiyami* [Infinite groups with involutions]. Krasnoyarsk: Sib. Fed. Univ. Publ., 2011, 149 p.

11. Cherep A.A. Set of elements of finite order in a biprimitively finite group. *Algebra and Logic*, 1987, vol. 26, no. 4, pp. 311–313. doi: 10.1007/BF01980245 .

12. Filippov K.A. On the periodic part of the Shunkov group, saturated with $L_2(p^n)$. *Vestnik SibGAU*, 2012, pp. 611–617 (in Russian).

13. Shlepkin A.A. On Shunkov groups, saturated with linear and unitary groups of dimension 3 over fields of odd orders. *Sib. Elektron. Mat. Izv.*, 2016, vol. 13, pp. 341–351 (in Russian). doi: 10.17377/semi.2016.13.029 .

14. Shlepkin A. On certain torsion groups saturated with finite simple groups. *Sib. Adv. Math.*, 1999, vol. 9, no. 2, pp. 100–108.

15. Shlepkin A.K. Conjugately biprimitively finite groups with the primary minimal condition. *Algebra Logic*, 1983, vol. 22, no. 2, pp. 165–169. doi: 10.1007/BF01978669 .

16. Shlepkin A.K. *Gruppy Shunkova s dopolnitel'nymi ogranicheniyami* [Shunkov groups with additional restrictions]. Dr. Sci. (Phys.–Math.) Diss. Krasnoyarsk, 1999, 187 p.

17. Shlepkin A.K. On the periodic part of some Shunkov groups. *Algebra and Logic*, 1999, vol. 38, no. 1, pp. 51–66. doi: 10.1007/BF02671670 .

Aleksei Anatolievich Shlepkin, Cand. Phys.-Math. Sci., Siberian federal university, Krasnoyarsk, 660041 Russia, e-mail: shlyopkin@gmail.com .