

Accepted Manuscript

Some characterizations of finite σ -soluble $P\sigma T$ -groups

Alexander N. Skiba

PII: S0021-8693(17)30573-2

DOI: <https://doi.org/10.1016/j.jalgebra.2017.11.009>

Reference: YJABR 16434

To appear in: *Journal of Algebra*

Received date: 2 April 2017

Please cite this article in press as: A.N. Skiba, Some characterizations of finite σ -soluble $P\sigma T$ -groups, *J. Algebra* (2018), <https://doi.org/10.1016/j.jalgebra.2017.11.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Some characterizations of finite σ -soluble $P\sigma T$ -groups

–In memory of Jim Beidleman

Alexander N. Skiba

Department of Mathematics and Technologies of Programming, Francisk Skorina Gomel State University,
Gomel 246019, Belarus

E-mail: alexander.skiba49@gmail.com

Abstract

Let $\sigma = \{\sigma_i | i \in I\}$ be some partition of the set of all primes $\mathbb{P}$ and G a finite group. G is said to be σ -soluble if every chief factor H/K of G is a σ_i -group for some $i = i(H/K)$.

A set $\mathcal{H}$ of subgroups of G is said to be a *complete Hall σ -set* of G if every member $\neq 1$ of $\mathcal{H}$ is a Hall σ_i -subgroup of G for some $\sigma_i \in \sigma$ and $\mathcal{H}$ contains exactly one Hall σ_i -subgroup of G for every $i \in I$ such that $\sigma_i \cap \pi(G) \neq \emptyset$. A subgroup A of G is said to be σ -permutable in G if G has a complete Hall σ -set $\mathcal{H}$ such that $AH^x = H^x A$ for all $x \in G$ and all $H \in \mathcal{H}$.

We obtain characterizations of finite σ -soluble groups G in which σ -permutability is a transitive relation in G .

1 Introduction

Throughout this paper, all groups are finite and G always denotes a finite group. Moreover, $\mathbb{P}$ is the set of all primes, $\pi = \{p_1, \dots, p_n\} \subseteq \mathbb{P}$ and $\pi' = \mathbb{P} \setminus \pi$. If n is an integer, the symbol $\pi(n)$ denotes the set of all primes dividing n ; as usual, $\pi(G) = \pi(|G|)$, the set of all primes dividing the order of G . G is said to be a D_π -group if G possesses a Hall π -subgroup E and every π -subgroup of G is contained in some conjugate of E .

In what follows, σ is some partition of $\mathbb{P}$, that is, $\sigma = \{\sigma_i | i \in I\}$, where $\mathbb{P} = \cup_{i \in I} \sigma_i$ and $\sigma_i \cap \sigma_j = \emptyset$ for all $i \neq j$; Π is always supposed to be a subset of the set σ and $\Pi' = \sigma \setminus \Pi$.

By the analogy with the notation $\pi(n)$, we write $\sigma(n)$ to denote the set $\{\sigma_i | \sigma_i \cap \pi(n) \neq \emptyset\}$; $\sigma(G) = \sigma(|G|)$. G is said to be: σ -primary [20] if G is a σ_i -group for some i ; σ -decomposable [21] or σ -nilpotent [14] if $G = G_1 \times \dots \times G_n$ for some σ -primary groups $G_1, \dots, G_n$; σ -soluble [20] if every chief factor of G is σ -primary; a σ -full group of Sylow type [20] if every subgroup E of G is a D_{σ_i} -group for every $\sigma_i \in \sigma(E)$. Note in passing, that every σ -soluble group is a σ -full group of Sylow type [22].

⁰Keywords: finite group, σ -permutable subgroup, $P\sigma T$ -group, σ -soluble group, σ -nilpotent group.

⁰Mathematics Subject Classification (2010): 20D10, 20D15, 20D30

Download English Version:

<https://daneshyari.com/en/article/8896511>

Download Persian Version:

<https://daneshyari.com/article/8896511>

[Daneshyari.com](https://daneshyari.com)