On unfaithful transitive representations of finite inverse symmetric semigroup $\mathcal{IS}_n$

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Let $N = \{1, 2, \ldots, n\}$ be a finite set. The semigroup of all partial one-to-one self-maps of N is called *the inverse symmetric semigroup* and is denoted by $\mathcal{IS}(N)$ or $\mathcal{IS}_n$. A homomorphism φ from any inverse semigroup S to the inverse symmetric semigroup $\mathcal{IS}(X)$ on a set X is called *a permutation representation*. The permutation representation $\varphi : S \to \mathcal{IS}(X)$ of the inverse semigroup S is called *transitive on* X if for any $a, b \in X$ there exists a partial permutation $h \in \varphi(S)$ such that $h(a) = b$. Every faithful transitive representation of the finite inverse symmetric semigroup $\mathcal{IS}_n$ is equivalent to the standard representation of $\mathcal{IS}_n$ by partial permutations of N [**?**].

We have counted the degrees of unfaithful transitive representations of the inverse symmetric semigroup $\mathcal{IS}_n$. An analogue of Bernside's lemma is proved for transitive permutation representations of $\mathcal{IS}_n$.

References

[1] T.V. Voloshyna, Effective transitive representations of the finite inverse symmetric semigroup //Bulletin of Kiev University, Series: Mathematics, Mechanics, no 2, 1998, 16-21.

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