On pairs of matrices that satisfy certain polynomial identities

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Abstract

Let $\mathbb{F}$ be an arbitrary field, H be a subgroup of the symmetric group of degree m, λ be an irreducible $\mathbb{F}$-valued character of H and d_λ^H be the generalized matrix function associated to H and λ. We denote by $\overline{C}(H, \lambda)$ the set of all pairs (A, B) of $m \times m$ matrices over $\mathbb{F}$ that satisfying

$$d_\lambda^H(AXB) = d_\lambda^H(X)$$

for all X. A first description of these pairs was presented by [2]. Using their description we are going to present some properties of these matrices. For instance, we prove that if $(A, B) \in \overline{C}(H, \lambda)$ then there is a positive integer p such that

$$\det(AB)^p = 1.$$

Keywords

Generalized matrix function.

References

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