

## Some Topics on Weighted Generalized Inverse and Kronecker Product of Matrices

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### ABSTRACT

In this paper, we present two general representations for the weighted generalized inverse  $A_{d,W}$ , which extends earlier results on the Drazin inverse  $A_d$ , group inverse  $A_g$  and usual inverse  $A^{-1}$ . The first one concerns with the matrix expression involving Moore-Penrose inverse  $A^+$ . The second one holds on the Kronecker products of two and several matrices. Furthermore, some necessary and sufficient conditions for Drazin and weighted Drazin inverses are given for the reverse order law  $(AB)_d = B_d A_d$  and  $(AB)_{d,Z} = B_{d,R} A_{d,W}$  to hold. Finally, we apply our result to present the solution of restricted singular matrix equations.

**Keywords:** Kronecker Product, Weighted Drazin Inverses, General algebraic structures, Index. Nilpotent matrix.

*(2000 Mathematics Subject Classification: 15A69 ; 15A09.)*